

PROCEEDINGS
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ZOOLOGICAL SOCIETY
OF LONDON.

PART VII.

1839.

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CORRIGENDA.

- P. 99. Line 3 of description of *Labrus laticlavius*, *for inque pinnâ productis, read*
inque pinnâ caudæ productis.
- P. 108. In the dimensions of *Phloeomys Cumingi*, *for Longitudo cranii ossei, 2" 4"*
read Longitudo cranii ossei, 3" 4".



PROCEEDINGS
OF THE
ZOOLOGICAL SOCIETY OF LONDON.

January 8th, 1839.

Professor Owen in the Chair.

Dr. Harlan read a paper entitled, "Description of a new species of *Meriones* inhabiting the United States of North America."

"A male and female specimen of the species which it is now proposed to add to the Fauna of the United States, were taken some time during 1836, on the farm of Mr. Beck, in Philadelphia County, a few miles north-east of the city. The female at the moment of her capture carried several young, which adhered to the teats firmly, notwithstanding the violent efforts and leaps of the parent.

"In the descriptive details which follow, the usual allowance must be made when such are drawn from impaled skins."

MERIONES MICROCEPHALUS. *Mer. supernè nigro flavoque mixtis, flavo apud latera prævalente ornatus; corpore subtùs albescente, flavidò lavato; auribus mediocribus, pilis flavis et nigris intermixtis, intùs atque extùs instructis.*

"Male. Length of the body, three inches ; of the tail, four inches ; total length of the hind leg, one inch four-eighths ; of the thigh, three-eighths ; of the leg, five eighths ; of the foot, four-eighths. Five toes behind ; four before ; with a rudimentary nailed thumb ; all the toes sparsely hairy, and terminating in strong, sharp claws.

"Colour above, plumbeous, interspersed with reddish fawn ; below, white, similarly interspersed in a less degree, a lateral longitudinal band of reddish fawn colour separating the sides from the abdomen ; tail, sparsely hairy, dark coloured above, white beneath, with a pencil of hairs at the extremity ; this member being proportionably longer, and the head much smaller and more elongated than in *G. Canadensis*. The last-named species has been figured by the late Professor B. T. Barton, in the Transactions of the American Philosophical Society, also in the Encyclopédie Méthodique, but was for the first time adequately described from living specimens in the 'Fauna Americana,' p. 156, when specimens were deposited in the cabinet of the Academy of Natural Science of Philadelphia.

"The subjects of the present memoir were placed in my hands for description by Mr. Chaloner, a Member of the Academy. The female is larger than the male, and of purer white beneath."

No. LXXIII.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

The specimens of *Gerbillus microcephalus* above referred to, were presented by Dr. Harlan to the Society; and also a species of *Spermophilus*, which Dr. Harlan exhibited to the Meeting. The last-mentioned animal very closely resembles the *S. Franklinii*; but being of a much smaller size, Dr. Harlan was anxious that it should be submitted to examination, and should be carefully compared with that animal upon some future occasion.

Several specimens of the Bean Goose (*Anser segetum*), the Gray-Lag Goose (*Anser cinereus*), the White-fronted Goose, (*Anser albifrons*), and of another species allied to these, were exhibited by Mr. A. D. Bartlett, in order to illustrate a paper which he communicated to the Meeting, "On a new British species of the genus *Anser*, with remarks on the nearly-allied species."

"It may be necessary, before describing the new species," says Mr. Bartlett, "to notice the three birds most nearly allied, in order more clearly to point out the distinctions existing between them; I do this in consequence of the imperfect descriptions given by authors, from which it is almost impossible to distinguish the species. I shall commence with that which is the most common.

"*Anser segetum*, Meyer. Bean Goose. Entire length, 33 inches; extent, 64; from the carpal joint to the end of wing, 19 inches. The head and neck are brown, tinged with grey: back and scapulars, darker brown, slightly tinged with grey, each feather being margined with greyish white; primaries, dark brown, tinged with grey; shoulders of wings and secondary quill-feathers, greyish brown; rump, blackish brown; upper tail-coverts, white; tail, dark brown, deeply edged with greyish white; breast and belly, dirty white; abdomen and under tail-coverts, pure white; bill, $2\frac{1}{4}$ inches long, rather slender, flattened and narrow towards the tip; the base, sides and nail, black; immediately above the nail commences a yellowish orange mark, extending a little beyond the anterior margin of the nostrils in front, and passing under and beyond the termination of them at the sides, but seldom reaching the corner of the mouth, except in very old individuals, in which this mark extends under and behind the nostrils, crosses the base of the bill next the forehead, leaving only the central part of the bill (between the nostrils) and the nail black; which latter part is sometimes, though rarely, white; legs and feet, reddish orange; wings, when closed, reaching 2 inches beyond the tail. The young of this species are darker, and the markings less distinct; the bill is shorter, the mark upon it narrower, and of a deep red colour; the legs and feet, pale orange.

"*Anser cinereus*, Meyer. Grey Lag Goose. Entire length, 35 inches; extent, 64; from the carpal joint to end of wing, $17\frac{1}{2}$ inches. The plumage more cinereous than in the last-described species; the shoulders and rump, light grey; breast and belly, white, sometimes spotted with black; the bill, $2\frac{1}{2}$ inches long; more robust, deeper, broader, and the laminae much more developed than in the Bean Goose, and of a dull yellow, inclining to flesh colour towards the nail, which is white; in summer the bill assumes a redder tint; legs

and feet, pale flesh colour; wings, when closed, even with the end of the tail. The young of this species are darker than the adults, but the grey upon the shoulders and rump, the form of the bill, and colour of the legs and feet, will always distinguish them from the young of any of the other species.

"*Anser albifrons*, Bechstein. White-fronted Goose. Entire length, 26 inches; extent, 52; from the carpal joint to end of wing, $16\frac{1}{2}$ inches. The adult of this species may be distinguished from others of the genus by the conspicuous white mark upon the forehead and sides of the bill, and the irregular patches of black and white upon the breast and belly; the bill, $1\frac{3}{4}$ of an inch long, of a reddish flesh colour; the nail, white; legs and feet, bright orange; wings, when closed, reaching $1\frac{1}{2}$ inch beyond the tail. The young of this species are much darker than the adult; the forehead and sides of the bill, nearly black; the breast and belly, dirty white, spotted with brown; bill, brown, inclining to flesh colour; nail, dark brown; legs and feet, pale orange.

"*Anser phænicopus*, Bartlett. Pink-footed Goose. Entire length, 28 inches; extent, 60; from carpal joint to end of wing, $17\frac{1}{2}$ inches. Top of the head and back of the neck, dark brown; sides of the face, forepart of the neck, and upper part of the breast, light brown; back and scapulars, dark brown, tinged with grey; each feather deeply margined with greyish white; shoulders of wings and rump, greyish ash; primaries, brown, tinged with grey; tail, brownish ash, deeply edged with white; lower part of belly, upper and under tail-coverts, pure white; legs and feet, of a reddish flesh colour or pink; the hind toe closely united by the membrane that runs along the edge of the inner toe; the feet, remarkably thick and fleshy; bill, $1\frac{2}{3}$ of an inch, long, narrow, and much contracted towards the tip; the base, sides and nail, black; the space between the nail and the nostrils, reddish flesh colour or pink; wings, when closed, reaching $1\frac{1}{2}$ inch beyond the tail.

"Having thus noticed the three nearly-allied species, and described the new one, I will endeavour to point out more particularly the distinctions between this new species and the Bean Goose, to which it bears the nearest resemblance. First, the great difference in the size; the average size of the Bean Goose is 33 inches in length, and 64 inches in extent; while the average size of the new species is 28 inches in length, and 60 inches in extent. Secondly, the bill is much smaller, shorter, more contracted towards the tip, and of a different colour. Thirdly, the difference in colour and in form of the legs and feet, and in the fleshy character of the foot, and the hind toe being more closely united by its membrane, has consequently, less freedom of motion. Fourthly, the plumage on the rump and shoulders being more inclined to grey. And lastly, in the form of the sternum, which differs from that of the Bean Goose in shape and bears a more close resemblance to that of the White-fronted Goose. In conclusion, I may remark that I have examined, in all, twelve specimens of this new species, four of which were alive; one of them is now living in the garden of the Zoological Society, where

it has been, I am told, eight years, without exhibiting any perceptible alteration in its plumage, or in the colour of its legs and feet.

"The Grey Lag Goose is by far the most rare of the four species here referred to."

Professor Owen commenced the reading of a paper, "On the Classification and Affinities of the Marsupial Animals."

January 22, 1839.

The Rev. F. W. Hope in the chair.

At the request of the chairman, Mr. Garnett exhibited a living Jerboa (apparently the *Dipus Aegyptiacus*), which had been sent to him from the Cape of Good Hope, but Mr. Garnett stated that he was not aware whether it had been captured in that part of Africa.

Professor Owen concluded his paper entitled, "Outlines of a Classification of the Marsupialia." "The rich stores of the Menagerie and Museum of the Zoological Society," observes Mr. Owen, "having afforded me frequent opportunities of examining the anatomy of various and rare species of the Marsupial order; the endeavour to express in general propositions the more important facts relative to their organization; to state in which particulars so many agreed or differed; has naturally compelled me to acquire certain ideas respecting their Zoological distribution."

In the first part of the paper, Professor Owen defines the general characters of the *Marsupialia*; he then proceeds to consider their mutual affinities; and, as closely connected with this subject, commences with some observations on their size, their geographical distribution, and their habits.

The carnivorous Marsupial animals belonging to the genera *Thylacinus* and *Dasyurus* are compared to the *Carnivora* in the placental series; and the Bandicoots (*Perameles*), and Myrmecobians are represented as typifying, or playing corresponding parts with those allotted to the placental *Insectivora*. Those Marsupials which have an omnivorous diet, live in trees, are provided with a prehensile tail, and have a thumb on the hinder extremities, are said to typify the *Quadrumana*, and the tailless Koala is compared to the arboreal Sun-Bears of the Indian Archipelago.

"Another genus of *Marsupialia*, the Wombat," says Mr. Owen, "presents the dentition which characterizes the placental *Rodentia*; and the Petaurists, like the Flying Squirrels, have a parachute formed by broad duplications of the skin extending laterally between the fore and hind legs.

"The Kangaroos are the true herbivorous *Marsupialia*, and many interesting physiological conditions present themselves to the mind in contemplating the singular construction and proportions of these animals. It would appear that the peculiarities of their gestation rendered indispensably necessary the possession of a certain prehensile faculty of the anterior extremities, with a free movement of the digits and a rotatory power of the fore-arm, in relation to the manipulations of the pouch and of the embryo developed therein. At the same time a herbivorous quadruped must possess great powers of locomotion in order to pass from pasture to pasture and to avoid

its enemies by flight. These powers, as is well known, are secured to the herbivorous species of the placental *Mammalia*, by an ungulate structure of four pretty equally developed members. Such a structure, however, would have been incompatible with the procreative œconomy of the Kangaroo. It is therefore organized for rapid locomotion by an excessive development of the hinder extremities; and these alone serve as the instruments of flight, which is performed by a succession of extensive bounds. The tail also is of great power and length, and in the stationary position, the body is supported erect on the tripod formed by the tail and hind legs; while in easy progression the tail serves as a crutch upon which and the fore feet the body is sustained while the hind legs are swung forwards.

"As the Australasian continent, the great metropolis of the Marsupial quadrupeds, still remains but very partially explored; and as new species and even genera of Marsupials continue at each expedition to reward the researches of the scientific traveller; and as moreover the recovery of two lost but distinct genera from the ruins of a former world makes it reasonable to suppose that other types of Marsupials remain still hidden in the crust of the earth; it can hardly be expected that the zoologist should be able to arrange in a natural series, with easy transitions according to the order of their affinities, the few and diversified forms of this implacental subclass which are at present known. The greatest number of correspondencies, as it appears to me, will be expressed by taking the modifications of the digestive system as the guide to the formation of the primary groups of the *Marsupialia*.

"The continent, however, in which the Marsupials 'most do congregate' is characterized by the paucity of organized matter upon its surface, and few of them, consequently, are nourished by a very well-defined diet. No large carnivorous quadruped could in fact have existed in the wilds of Australia prior to the introduction of civilized man and his attendant herds: and we find, in fact, that the native genera which are the most decidedly carnivorous, do not include species larger than the dog: we can only reckon among these strictly carnivorous species the Thylacines and the Dasyures; and, on the other hand, not more than two or three Marsupial genera feed exclusively on vegetable substances. The rest of them derive a promiscuous nutriment from dead or decayed animal and vegetable matter, crustacea, and the refuse of the sea-shore, insects in their perfect and larva states, live birds, young and succulent sprouts, leaves, fruits, &c. The terms, therefore, which will be given to the different primary subdivisions in the present classification of the *Marsupialia* must not be understood to indicate strictly or exclusively the nature of the food of the species severally included in these groups, but rather their general tendency to select for their support the substances implied by those designations."

Tribe I. *SARCOPHAGA*.

The genera in this tribe are the most decidedly carnivorous of all

the *Marsupialia*, and are characterized by an important anatomical condition, viz. the absence of an *intestinum cæcum*.

Genus 1. *Thylacinus.*

Incisors $\frac{4-4}{3-3}$; canines $\frac{1-1}{1-1}$; præmolares $\frac{3-3}{3-3}$; molares $\frac{4-4}{4-4} = 46$.

The incisors are of equal length, and regularly arranged in the segment of a circle with an interspace in the middle of the series of both jaws. The external incisor on each side is the strongest.

The laniary or canine teeth are long, strong, curved, and pointed, like those of the dog tribe.

The spurious molares are of a simple, blunt, conical form, each with two roots; the last with a small additional posterior cusp. The true molares in the upper jaw are unequally triangular with three tubercles. Those in the lower jaw are compressed, tricuspidate, the middle cusp being the longest, especially in the two last molares, which resemble closely the sectorial teeth (*dens carnassiers*) of the Dog and Cat. The fore feet are 5-digitate, the hind feet 4-digitate.

On the fore foot the middle digit is the longest, the internal one or *poller* the shortest, but the difference is slight. On the hind foot the two middle toes are of nearly equal length and longer than the two lateral toes, which are equal. All the toes are armed with strong, blunt, and almost straight claws. The only known species of this genus, the Thylacine (*Thylacinus Harrisii*, *Didelphys Cynocephalus*, Harris), is a native of Van Diemen's Land, and is called by the colonists the 'Hyæna.'

Genus *Dasyurus.*

Incisors $\frac{4-4}{3-3}$; canines $\frac{1-1}{1-1}$; præmolares $\frac{2-2}{2-2}$; molares $\frac{4-4}{4-4} = 42$.

The eight incisors of the upper jaw are of the same length and simple structure, and are arranged in a regular semicircle without any middle interval. The six incisors of the lower jaw are similarly arranged but have thicker crowns than the upper ones; the canines present the same or even a greater relative development than in the Thylacine. In an extinct species of *Dasyurus* they present the same form and relative properties as in the Leopard. The spurious molares have two fangs and a pointed compressed triangular crown with a rudimentary tubercle at the anterior and posterior part of its base. The grinding surface of the true molares in the upper jaw is triangular; the first presents four sharp cusps, the second and third each five, the fourth, which is the smallest, only three. In the lower jaw the last molar is nearly of equal size with the penultimate one, and is bristled with four cusps, the external one being the longest; the second and third molares have five cusps, three on the inner and two on the outer side; the first molar has four cusps: these are all sharply pointed in the young animal, in which the tubercle of the posterior molar of the lower jaw is divided into two small cusps.

The carnivorous character of the previous dentition is most

strongly marked in the Ursine Dasyuré, or Devil of the Tasmanian colonists, the largest existing species of the genus, and a most pestilent animal in the poultry yard or larder.

Genus *Phascogale*.

Incisors $\frac{4-4}{3-3}$; canines $\frac{1-1}{1-1}$; præmolares $\frac{3-3}{3-3}$; molares $\frac{4-4}{4-4} = 46$.

In the present dental formula may be discerned a step in the transition from the Dasyures to the Opossums, not only in the increased number of spurious molares, but also in shape and proportions of the incisors. In the upper jaw the two middle incisors are longer than the rest, and separated from them by a brief interval; they are more curved and project more forward. The three lateral incisors diminish in size to the outermost. The middle incisors of the lower jaw also exceed the lateral ones in size, and project beyond them but not in the same degree, nor are they separated from them by an interval as in the upper jaw. The canines are relatively smaller than in the Dasyures. The spurious molares present a similar form, but the third is much smaller and simpler than the two preceding ones. The true molares resemble in their structure those of the Dasyures. The general character of the dentition of these small Marsupials approximates to the insectivorous type in the Shrew, Hedgehog, &c., among the placental *Mammalia*; and corresponds with the food and habits of the species which thus lead from the Zoophagous to the Entomophagous tribe.

Other links which once bound these tribes more closely together are now lost, and are indicated only by the few fossil remains which have rendered the Stonesfield oolite so celebrated. One of these extinct genera, which I have called *Phascolotherium*, presents the same numerical formula, apparently, as in the *Thylacinus* and *Phascogale*; but, if another incisor existed in each ramus of the lower jaw, as seems to be indicated by the fossil, then the dentition will agree with that of the genus *Didelphis*.

Incisors $\frac{? - ?}{3-3}$; canines $\frac{? - ?}{1-1}$; præmolares $\frac{? - ?}{3-3}$; molares $\frac{? - ?}{4-4}$.
or
 $\frac{4-4}{4-4}$

The incisors and canines are separated by vacant interspaces, and occupy a large proportion of the dental series; the true molares resemble those of *Thylacinus*.

Tribe II. *ENTOMOPHAGA*.

This is the most extensive and varied of the primary groups of the Marsupial order. In the system of Cuvier, the species of this tribe are united with those of the preceding to form a single group characterized by the presence of long canines and small incisors in both jaws; but in most of the Entomophagous genera of the present classification, the canines present a marked inferiority of development, and the species are consequently unable to cope with animals of their own size and grade of organization, but prey upon the smaller and weaker classes of invertebrate animals. Their intestinal

canal is complicated by a moderately long and large cæcum; and, while in the *Sarcophaga*, the feet are organized, as in the ordinary placental *Digitigrades*, they present in the present tribe a variety of well-marked modifications, according to which the species may be arranged into ambulatory, saltatory, and scansorial groups.

AMBULATORIA.

The only known existing representative of this family is the animal described by Mr. Waterhouse, which constitutes the type of his genus *Myrmecobius*, of which the following is the remarkable dental formula:

$$\text{Incisors } \frac{4-4}{3-3}; \text{ canines } \frac{1-1}{1-1}; \text{ præmolares } \frac{3-3}{3-3}; \text{ molares } \frac{5-5}{6-6} : = 52.$$

From which it will be seen, that the number of molares, sixteen in the upper and eighteen in the lower jaw, exceeds that of any other known existing Marsupial, and approaches that which characterizes some of the insectivorous armadilloes. The resemblance to *Dasypus* is further carried out in the small size of the molares, their separation from each other by slight interspaces, and their implantation in sockets which are not formed by a well-developed alveolar ridge. The molares, however, present a distinct tuberculate structure; and both the true and false ones possess two separate fangs as in their Marsupial congeners: they are, however, the least produced of any Marsupials; only the triturating tubercles appearing above the gum.

The false molares present the usual compressed triangular form, with the apex slightly recurved, and the base more or less obscurely notched before and behind. The canines are very little longer than the false molares; the incisors are minute, slightly compressed and pointed; they are separated from each other and the canines by wide intervals.

The Myrmecobians are insectivorous, and shelter themselves in the hollows of trees, frequenting most, it is said, those situations where the Port Jackson Willow abounds. In the structure and proportions of the hinder feet, *Myrmecobius* resembles the Dasyurine family; and in the slightly developed canines, the smooth external surface of the skull, the breadth between the zygomata, and the absence of the interparietal ridges, as well as in the general external form and bushy tail, it offers an especial approximation to the genus *Phascogale*.

Intermediate however to *Myrmecobius* and *Phascogale* would seem to be the station held by the interesting extinct genera above alluded to. In *Phascolotherium* the affinity is manifested in the simple form, small size, and straggling disposition of the incisors and canines: in the other genus, *Thylacotherium*, it is displayed in the size and number of its molares.

This, one of the most ancient mammiferous genera hitherto discovered, presents eleven molares on each side of the lower jaw, which resemble in structure and close arrangement those of *Phascogale* and *Didelphis*, while they are intermediate in their proportional

size to these and *Myrmecobius*. The exact condition of the incisors and canines of the *Thylacotherium* has not yet been displayed in the fossil jaws which have been discovered.

SALTATORIA.

Genus *Perameles* (Bandicoots).

Incisors $\frac{5-5}{3-3}$; canines $\frac{1-1}{1-1}$; præmolares $\frac{3-3}{3-3}$; molares $\frac{4-4}{4-4} = 48$.

This dental formula characterizes a number of Rat-like *Insectivora* commonly known in Australia by the name of Bandicoots; the hind legs are longer and stronger than the fore, and exhibit in a well-marked manner the feeble and slender condition of the second and third digits counting from the inside, and the sudden increase in length and strength of the third and fourth digits, which are chiefly subservient to locomotion: the mode of progression in the Bandicoots is by bounds; the hind and fore feet being moved alternately as in the Hare and Rabbit; and the crupper raised higher than the fore quarter. The teeth which offer the greatest range of variation in the present genus are the external or posterior incisors and the canines: the molares, also, which originally are quinque-cuspidate, have their points worn away, and present a smooth and oblique grinding surface in some species sooner than in others.

The Bandicoots which approach nearest to the *Myrmecobius* in the condition of the incisive and canine teeth are the *Perameles obesula* and *P. radiata*. There is a slight interval between the first and second incisor, and the outer or fifth incisor of the upper jaw is separated from the rest by an interspace equal to twice its own breadth, and moreover presents the triangular, pointed, canine-like crown which characterizes all the incisors of *Myrmecobius*; but the four anterior incisors are closely arranged together and have compressed, quadrate, true incisive crowns. From these incisors the canine is very remote, the interspace being equally divided by the fifth pointed incisor, which the canine very slightly exceeds in size. In *Peram. nasuta* the incisor presents the same general condition, but the canines are relatively larger.

The marsupial pouch in the Bandicoots, at least in the full-grown females of *Per. nasuta*, *Per. obesula*, and *Per. lagotis*, has its orifice directed downwards or towards the cloaca, contrariwise to its ordinary disposition in the Marsupials: this direction evidently relates to the position of the trunk when supported on the short fore and long hind legs. In the stomach and intestines of a *Perameles obesula*, I found only the remains of insects; and in the examination of the alimentary canal of a *Per. nasuta*, Dr. Grant obtained the same results.

Genus *Chæropus*.

The singular animal on which this genus is founded is briefly noticed and figured in Major Mitchell's *Australia*, (vol. ii. pl. 38. p. 131.) and the individual described is preserved in the Colonial Museum, at Sydney, N. S. Wales, (No. 35. of Mr. George Bennett's

Catalogue). It would appear that the two outer toes of the forefoot, which are always very small in the true Bandicoots, are entirely deficient in the *Chæropus*, unless some rudiments should exist beneath the skin; at all events only two toes are apparent externally, but they are so armed and developed as to be serviceable for burrowing or progression. The inner toe is wanting on the hind foot. Dental formula:

Incisors $\frac{4-4}{3-3}$; canines $\frac{1-1}{1-1}$; præmolares $\frac{3-3}{3-3}$; molares $\frac{4-4}{4-4} = 46.$

All the teeth are of small size; the canines resemble the spurious molares in size and shape, and these are separated at intervals as in *Myrmecobius*. The marsupium opens downwards in the *Chæropus*, as in the true Bandicoots. The species described has no tail. The genus would seem by its dentition to rank between *Myrmecobius* and *Perameles*. Its digital characters are anomalous and unique among the *Marsupialia*.

SCANSORIA.

Didelphidæ, Opossums.

These Marsupials are now exclusively confined to the American Continents, although the fossil remains of a small species attest the former existence of the genus *Didelphis* in Europe contemporaneously with the Palæothere, Anoplothere, and other extinct Pachyderms whose fossil remains characterize the Eocene strata of the Paris Basin. The dental formula of the genus *Didelphis* is,

Incisors $\frac{5-5}{4-4}$; canines $\frac{1-1}{1-1}$; præmolares $\frac{3-3}{3-3}$; molares $\frac{4-4}{4-4} = 50.$

The Opossums resemble in their dentition the Bandicoots more than the Dasyures, except in the structure of the molares.

The two middle incisors of the upper jaw are more produced than the others, from which they are separated by a short interspace. The canines are well developed, the upper being always stronger than the lower. The false molares are simply conical; the true ones beset with sharp points, which wear down into tubercles as the animal advances in age.

In the type of the subgenus *Cheironectes*, besides being web-footed, the anterior extremities present an unusual development of the pisiform bone, which supports a fold of the skin, like a sixth digit; it has indeed been described, as such, by M. Temminck; this process has not of course any nail. The dentition of the Yapock resembles that of the ordinary *Didelphis*. All the Opossums have the inner digit of the hind foot converted by its position and development into a thumb, but without a claw. The hinder hand is associated in almost all the species with a scaly prehensile tail.

In some of the smaller Opossums the subabdominal tegumentary folds merely serve to conceal the nipples, and are not developed into a pouch; the young in these adhere to the mother by entwining their little prehensile tails around hers, and cling to the fur of the back; hence the term *dorsigera* applied to one of these Opossums*.

* Few facts would be more interesting in the present branch of zoology than the condition of the new-born young, and their degree and mode of

Tribe III. *CARPOPHAGA.*

Stomach simple; cæcum very long.

In this family, the teeth, especially those at the anterior part of the mouth, present considerable deviations from the previously described formulæ; the chief of which is a predominating size of the two anterior incisors, both in the upper and lower jaw. Hitherto we have seen that the dentition in every genus has participated more or less of a carnivorous character; henceforth it will manifest a tendency to the Rodent type.

The Phalangers, so called from the phalanges of the second and third digits of the hinder extremities being inclosed in a common sheath of integument, have the innermost digit modified, to answer the purposes of a thumb; and the hinder hand being associated in many of the species with a prehensile tail, they evidently, of all *Frugivora*, come nearest the arboreal species of the preceding section. In a system framed on locomotive characters they would rank in the same section with the Opossums. We have seen, however, that they differ from those Entomophagous Marsupials greatly in the condition of the intestinal tube. Let us examine to what extent the dental characters deviate from those of the Opossums.

In the skull of a *Phalangista Cookii*, now before me, there are both in the upper and lower jaw four true molares on each side, each beset with four three-sided pyramidal sharp-pointed cusps; thus these essential and most constant teeth correspond in number with those of the Opossum: but in the upper jaw they differ in the absence of the internal cusp, which gives a triangular figure to the grinding surface of the molares in the Opossum; and the anterior single cusp is wanting in the true molares of the lower jaw.

Anterior to the grinders in the Phalanger, there are two spurious molares, of similar shape and proportions to those in the Opossum; then a third spurious molar, too small to be of any functional importance, separated also, like the corresponding anterior false molar in the Opossum, by a short interval from those behind.

The canine tooth but slightly exceeds in size the above false molar, and consequently here occurs the first great difference between the Phalangers and Opossums; it is however, only a difference in degree of development; and in the Ursine and other Phalangers, as well as in the Petaurists, the corresponding tooth presents more of the proportions and form of a true canine.

The incisors, which we have seen to be most variable in number in the carnivorous section, are here three instead of five on each side, in the upper jaw, but their size, especially that of the first, compensates for their fewness.

In the lower jaw, there is the same number of true molares and of functional false molares, which form a continuous and tolerably equable series, as in the Opossums, on each side; then two very minute and

uterine development in these Opossums. Since the marsupial bones serve not, as is usually described, to support a pouch, but to aid in the function of the mammary glands and testes, they of course are present in the skeleton of these small pouchless Opossums, as in the more typical Marsupials.

rudimental teeth on each side represent the small spurious molar, and small canine of the upper jaw; and anterior to these, there is one very small and one very large and procumbent incisor on each side.

The constant teeth in this group are the $\frac{4-4}{4-4}$ true molares, and the $\frac{3-3}{1-1}$ incisors. The canines $\frac{1-1}{1-1}$ are constant in regard to their presence, but variable in size; they are always minute in the lower jaw. With respect to the spurious molares, $\frac{1-1}{1-1}$, they are always in contact with the true grinders, and their crowns reach to the same grinding level; sometimes a second spurious molar is similarly developed as in the *Phal. Cookii*, and as in all the flying Phalangers, or Petaurists, but it is commonly absent or replaced by a very minute tooth, shaped like a canine: so that between the posterior spurious grinder and the incisors we may find three teeth, of which the posterior is the largest, as in *Phal. Cookii*, or the smallest, as in *Phal. cavifrons*; or there may be only two teeth, as in *Phal. ursina* and *Phal. vulpina*, and the species, whatever that may be, which Fr. Cuvier has selected as the type of the dentition of this Genus.

In the lower jaw similar varieties occur in these small and unimportant teeth; e. g. there may be between the procumbent incisors and the posterior false molar, either four teeth, as in *Phal. Cookii*; or three, as in *Phal. cavifrons*; or two, as in *Phal. ursina*, *Phal. maculata*, *Phal. chrysorrhoos*; or lastly, one, as in *Phal. vulpina*, and *Phal. fuliginosa*.

The most important modification is presented by the little *Phal. gliriformis* of Bell, which has only three true molares on each side of each jaw.

Genus *Petaurus*.

There are many species of Marsupials limited to Australia, and closely resembling or identical with the true Phalangers in their dental characters and the structure of the feet. I allude to the Petaurists or Flying Opossums; these, however, present an external character so easily recognizable, and influencing so materially the locomotive faculties, as to claim for it more consideration than the modifications of the digits or spurious molares, which we have just been considering in the *Phalangista*. A fold of the skin is extended on each side of the body between the fore and hind legs, which, when outstretched, forms a lateral wing or parachute, but which, when the legs are in the position for ordinary support or progression, is drawn close to the side of the animal by the elasticity of the subcutaneous cellular membrane, and then forms a mere tegumentary ridge. These delicate and beautiful Marsupials have been separated generically from the other Marsupials under the name of *Petaurus**: they further differ from the Phalangers in wanting the prehensile character of the tail, which in some species of *Petaurus* has a general clothing of long and soft hairs, whilst in others the hairs are arranged in two lateral series.

Now in the Petaurists there is as little constancy in the exact

* First by Dr. Shaw in the *Naturalist's Miscellany*.

formula of the dentition as among the Phalangers. The largest species of *Petaurus*, *Pet. Taguanoides*, e. g., is almost identical in this respect with the *Phalangista Cookii*, which M. Fr. Cuvier has therefore classed with the *Petauri*. Those teeth of *Pet. Taguanoides*, which are sufficiently developed, and so equal in length, as to exercise the function of grinders, or in other words, the functional series of molares, include six teeth on each side of the upper jaw, and five teeth on each side of the lower jaw. The four posterior molares in each row are true, and bear four pyramidal cusps, excepting the last tooth in the upper jaw, which, as in *Phal. Cookii*, has only three cusps. In the upper jaw, the space between the functional false molares and the incisors is occupied by two simple rudimentary teeth, the anterior representing the canine, but being relatively smaller than in *Phal. Cookii*. The crowns of the two anterior incisors are relatively larger. In the lower jaw the sloping alveolar surface between the functional molares and large procumbent incisors is occupied, according to M. Fr. Cuvier, by two rudimentary minute teeth: I have not found any trace of these in the two skulls of *Pet. Taguanoides* examined by me. In *Phal. Cookii* there are three minute teeth in the corresponding space, but these differences would not be sufficient ground to separate generically the two species if they were unaccompanied by modifications of other parts of the body. In *Petaurus sciureus* and *Petaurus flaviventer* the dentition more nearly resembles that of *Phalangista vulpina*. In the upper jaw the functional molar series consists of five teeth on each side, the four hinder ones being, as in *Pet. Taguanoides*, true tuberculate molares, but diminishing more rapidly in size, as they are placed further back in the jaw: the hinder tooth has three tubercles, the rest four; their apices seem to be naturally blunter than in *Pet. Taguanoides*. Between the functional false molar and the incisors there are three teeth, of which the representative of the canine is relatively much larger than in the *Pet. Taguanoides*; the first false molar is also larger, and has two roots; the second, which is functional in *Pet. Taguanoides*, is here very small; the first incisor is relatively larger and is more produced. In the lower jaw the functional series of grinders consists of the four true tuberculate molares only, of which the last is relatively smaller, and the first of a more triangular form than in *Pet. Taguanoides*. The space between the tuberculate molares and the procumbent incisor is occupied by four small teeth, of which the one immediately anterior to the molares has two roots, the remaining three are rudimentary and have a single fang. Among the species exhibiting this dental formula, viz., incisors $\frac{3-3}{1-1}$; canines $\frac{1-1}{1-1}$; premolares $\frac{3-3}{3-3}$; molares $\frac{4-4}{4-4}$: = 40: are *Pet. sciureus*, *Pet. flaviventer*, and *Pet. macrurus*.

The Pigmy Petaurist differs from the preceding and larger species in having the hairs of the tail distichous or arranged in two lateral series like the barbs of a feather; and in having the spurious molares large and sharply pointed; and the true molares bristled each with four acute cusps. This tendency in the dentition to the insectivorous

character, with the modification of the tail, induced M. Desmarest to separate the Pigmy Petaurist from the rest of the species, and constitute a new subgenus under the name of *Acrobata*.

In four adult specimens, and two of which had young in the pouch, I find the following dental formula to be constant ;—incisors $\frac{3-3}{1-1}$; canines $\frac{1-1}{1-1}$; præmolares $\frac{3-3}{3-3}$; molares $\frac{3-3}{3-3} = 36$.

The three quadricuspidate grinders of the upper jaw are preceded by three large spurious molares, each of which has two fangs, and a compressed, triangular, sharp-pointed crown, slightly but progressively increasing in length, as they are placed forwards. An interspace occurs between these and the canine, which is long, slender, sharp-pointed, and recurved. The first incisor is longer than the two behind, but is much shorter than the canine. In the lower jaw the true molares are preceded by two functional false ones, similar in size and shape to the three above; the anterior false molar and the canine are represented by minute, rudimental, simple teeth; the single incisor is long and procumbent, as in the other Petaurists.

Genus *Phascolarctus*.

The absence of anomalous spurious molares and of inferior canines appears to be constant in the only known species of this genus. The dental formula in three of this species, (*Phasc. fuscus* Desm.,) is : Incisors $\frac{3-3}{1-1}$; canines $\frac{1-1}{0-0}$; præmolares $\frac{1-1}{1-1}$; molares $\frac{4-4}{4-4} = 30$.

The true molares are larger in proportion than in the Phalangers; each is beset with four three-sided pyramids, the cusps of which wear down in age; the outer series in the upper teeth being the first to give way; those of the lower jaw are narrower than those of the upper. The spurious molares are compressed, and terminate in a cutting edge; in those of the upper jaw there is a small parallel ridge along the inner side of the base. The canines slightly exceed in size the posterior incisors; they terminate in an oblique cutting edge rather than a point, their fang is closed at the extremity; they are situated as in the Phalangers close to the intermaxillary suture. The lateral incisors of the upper jaw are small and obtuse, the two middle incisors are of twice the size, conical, subcompressed, beveled off obliquely to an anterior cutting edge, but differing essentially from the *dentes scalprarii* of the *Rodentia*, in being closed at the extremity of the fang. The two incisors of the lower jaw resemble those of the upper, but are longer and more compressed: they are also formed by a temporary pulp, and its absorption is accompanied by a closure of the aperture of the pulp cavity, as in the upper incisors. The Koala therefore, in regard to the number, kind, and conformation of its teeth, closely resembles the Phalangers, with which it agrees in its long caecum, but the stomach has a cardiac gland as in the Wombat. The extremities of the Koala are organized for prehension; each is terminated by five digits; the hind feet are provided with a large thumb, and have the two contiguous digits enveloped in the same tegumentary fold; the anterior digits are divided into two groups, the thumb and index being opposed to the other

three fingers. The fore-paws have a similar structure in some of the small Phalangers ; it is very conspicuous in some of the Petaurists. The Koala, however, differs from the Phalangers and Petaurists in the extreme shortness of its tail and in its more compact and heavy general form. It is known to feed on the buds and leaves of the trees in which it habitually resides.

Tribe IV. *POEPHAGA.*

The present tribe includes the most strictly vegetable feeders ; all the species have a complex sacculated stomach and a long simple cæcum.

Guided by the modifications of the teeth we pass from the Koala to the Kangaroo family (*Macropodidae*),—animals of widely different general form. The Potoroos, however, in this group, present absolutely the same dentition as the Koala, some slight modifications in the form of certain teeth excepted. The spurious molares, in their longitudinal extent, compressed form, and cutting edge, would chiefly distinguish the dentition of the Potoroo, but the Koala evidently offers the transitional structure between the Phalangers and Potoroos in the condition of these teeth, of which one only is retained on each side of each jaw, in both *Phascolarctus* and *Hypsiprymnus*.

The dental formula of the genus *Hypsiprymnus* is : incisors $\frac{3-3}{1-1}$; canines $\frac{1-1}{0-0}$; præmolares $\frac{1-1}{1-1}$; mol. $\frac{4-4}{4-4} = 30$.

The two anterior incisors are longer and more curved, the lateral incisors relatively smaller than in the Koala. The pulps of the anterior incisors are persistent.

The canines are larger than in the Koala ; they always project from the line of the intermaxillary suture ; and while the fang is lodged in the maxillary bone, the crown projects almost wholly from the intermaxillary. In the large *Hypsiprymnus ursinus* the canines are relatively smaller than in the other Potoroos, a structure which indicates the transition from the Potoroo to the Kangaroo genus. In the skeleton of this species in the Leyden Museum the canines present a longitudinal groove on the outer side.

The characteristic form of the trenchant spurious molar has just been alluded to ; its maximum of development is attained in the arboreal Potoroos of New Guinea (*Hypsiprymnus ursinus*, and *Hyps. dorsocapitalis*) ; in the latter of which its antero-posterior extent nearly equals that of the three succeeding molar teeth.

In all the Potoroos the trenchant spurious molar is sculptured, especially on the outer side, and in young teeth by many small vertical grooves. The true molares each present four three-sided pyramidal cusps, but the internal angles of the two opposite cusps are continued into each other across the tooth, forming two concave transverse ridges. In the old animal these cusps and ridges disappear, and the grinding surface is worn quite flat.

In the genus *Macropus* the normal condition of the permanent teeth may be expressed as follows :—incisors $\frac{3-3}{1-1}$; canines $\frac{0-0}{0-0}$; præmolares $\frac{1-1}{1-1}$; molares $\frac{4-4}{4-4} = 28$.

The main difference, as compared with *Hypsiprymnus*, lies in the absence of the upper canines; yet I have seen them present, but of very small size, and concealed by the gum, in a small species of Kangaroo (*Macropus rufiventer*, Ogilby.). This, however, is a rare exception; while the constant presence and conspicuous size of the canines will always serve to distinguish the Potoroo from the Kangaroo. But besides this, there are other differences in the form and proportions of certain teeth.

The upper incisors of the *Macropi* have their cutting margins on the same line, the anterior ones not being produced beyond that line as in the *Hypsiprymnii*; the third or external incisor is also broader in the Kangaroos, and is grooved and complicated by one or two folds of the enamel continued, from the outer side of the tooth obliquely forwards and inwards, into the substance of the tooth. In most species the anterior fold is represented by a simple groove; the relative size of the outer incisor, the extent and position of the posterior fold of enamel, and consequently the proportions of the part of the tooth in front or behind it, vary more or less in every species of *Macropus*: there are two folds of enamel near the anterior part of the tooth in *Macr. major*; the posterior portion is of the greatest extent, and the entire crown of the tooth is relatively broadest in this species. The middle incisor is here also complicated with a posterior notch and an external groove. These modifications of the external incisors have been pointed out in detail by M. Jourdan; and subgeneric distinctions have been subsequently based upon them; but they possess neither sufficient constancy nor physiological consequence, to justify such an application. M. Fr. Cuvier has proposed a binary division of the Kangaroos founded on the absence of permanent spurious molars and a supposed difference in the mode of succession of the permanent molars in the Kangaroos, combined with modifications of the muzzle or upper lip, and of the tail.

The dental formula which I have assigned to the genus *Macropus* is restricted by that naturalist in its application to some small species of Kangaroo, grouped together under the term *Halmaturus*, originally applied by Illiger to the Kangaroos generally. The rest of the Kangaroos, under the generic term *Macropus*, are characterized by the following dental formula:—incisors $\frac{6}{2}$; mol. $\frac{4-4}{4-4} = 24$.

The truth, however, is, that both the *Halmaturi* and *Macropi* of Fr. Cuvier, have their teeth developed in precisely the same number and manner; they only differ in the length of time during which certain of them are retained. In the great Kangaroo, for example, the permanent spurious molar which succeeds the corresponding deciduous one in the vertical direction, is pushed out of place and shed by the time the last true molar has cut the gum: the succeeding true molar is soon afterwards extruded; and I have seen a skull of an old *Macropus major* in the Museum at Leyden, in which the grinders were reduced to two on each side of each jaw by this yielding of the anterior ones to the vis a tergo of their successors.

Tribe V. *RHIZOPHAGA.*

The characters of this tribe are taken from the stomach, which is simple in outward form, but complicated within by a large cardiac gland; and from the cæcum, which is short and wide, with a vermi-form appendage.

Genus *Phascolomys.*

In its heavy shapeless proportions, large trunk, and short equally developed legs, the Wombat offers as great a contrast to the Kangaroos as does the Koala, which it most nearly resembles in its general outward form and want of tail. But in the more important characters afforded by the teeth and intestinal canal the Wombat differs more from the Koala than this does from either the Phalangers or Kangaroos. The dental system presents the extreme degree of that degradation of the teeth intermediate between the front incisors and true molares which we have been tracing from the Opossum to the Kangaroos: not only have the functionless spurious molares and canines now totally disappeared, but also the posterior incisors of the upper jaw, which we have seen in the Potoroos to exhibit a feeble degree of development as compared with the anterior pair; these in fact are alone retained in the dentition of the present group, which possesses the fewest teeth of any Marsupial animal. The dental formula of the Wombat is thus reduced both in number and kind to that of the true *Rodentia*:

Incisors $\frac{2}{2}$; canines $\frac{0}{0}$; præmolares $\frac{1-1}{1-1}$; molares $\frac{4-4}{4-4} : = 24$.

The incisors, moreover, are true *dentes scalprarii*, with persistent pulps, but are inferior, especially in the lower jaw, in their relative length, and curvature, to those of the placental *Glires*: they present a subtriangular figure, and are traversed by a shallow groove on their inner surfaces.

The spurious molares present no trace of that compressed structure which characterizes them in the Koala and Kangaroos: but have a wide, oval, transverse section: those of the upper jaw being traversed on the inner side with a slight longitudinal groove. The true molares have double the size of the spurious ones: the superior ones are also traversed by an internal longitudinal groove, but this is so deep and wide, that it divides the whole tooth into two prismatic portions, with one of the angles directed inwards. The inferior molares are in like manner divided into two trihedral portions, but the intervening groove is here external, and one of the faces of each prism is turned inwards. All the grinders are curved, and describe about a quarter of a circle; in the upper jaw the concavity of the curve is directed outwards, in the lower jaw inwards. The false and true molares like the incisors have persistent pulps, and are consequently devoid of true fangs: in which respect the Wombat differs from all other Marsupials, and resembles the extinct *Toxodon*, the dentigerous *Bruta*, and herbivorous *Rodentia*.

Although none of the *Marsupalia* possess teeth composed of an intermixture of layers of ivory, cement and enamel through the body

of the crown; yet the layer of cement which covers the enameled crown is thickest in the vegetable-feeding Marsupials, and is remarkably distinct in the Wombat.

I may add that the Wombat deviates from the other Marsupials in the number of its ribs: as these are very constant in the rest of the order, the difference in the Wombat, which has 15 pairs, instead of 13 or 12, is the more deserving of notice. The Koala, like the Phalangers and Kangaroos, has 13 pairs of ribs.

Professor Owen next proceeds to compare the classification of the *Marsupialia* here proposed with that of Cuvier, given in the second edition of the *Règne Animal*, and states the reasons which have led him to devise a new arrangement.

The following is a tabular view of Professor Owen's classification.

CLASSIFICATION OF THE MARSUPIALIA.

Tribus.	Families.	Genera.	Subgenera.
SARCOPHAGA.			
Three kinds of teeth; canines long in both jaws; a simple stomach; no <i>intestinum cæcum</i> .	<i>Dasyuridae</i> . .	{ <i>Thylacinus</i> . <i>Dasyurus</i> . <i>Phascogale</i> .	
Extinct transitional forms	{ <i>Phascolotherium</i> . <i>Thylacotherium</i> . } Fossil.	
ENTOMOPHAGA.			
Three kinds of teeth in both jaws; a simple stomach; a moderately long <i>intestinum cæcum</i> .	<i>Ambulatoria</i> . .	<i>Myrmecobius</i> .	
	<i>Saltatoria</i> . .	{ <i>Chæropus</i> . <i>Perameles</i> .	
	<i>Scansoria</i> . .	<i>Didelphis</i> . . . <i>Cheironectes</i> .	
CARPOPHAGA.			
Anterior incisors large and long in both jaws; canines inconstant; a simple stomach; a very long <i>intestinum cæcum</i> .	<i>Phalangistidae</i> . .	{ <i>Phalangista</i> . . . <i>Petaurus</i> . } <i>Cuscus</i> . <i>Pseudocheirus</i> . <i>Tapoia</i> . <i>Acrobata</i> .	
	<i>Phascolarctidae</i> . .	<i>Phascolarctus</i> .	
POEPHAGA.			
Anterior incisors large and long in both jaws; canines present in the upper jaw only, or wanting. A complex stomach; a long <i>intestinum cæcum</i> .	<i>Macropodidae</i> . .	{ <i>Hypsiprymnus</i> . <i>Macropus</i> . } <i>Halmaturus</i> . <i>Macropus</i> .	
RHIZOPHAGA.			
Two scaliform incisors in both jaws; no canines. Stomach with a special gland; cæcum short, wide, with a vermiciform appendage.	<i>Phascolomyidae</i> . .	{ <i>Phascolomys</i> . <i>Diprotodon</i> . } Fossil.	



February 12, 1839.

Thomas Bell, Esq., V.P., in the Chair.

A paper from Dr. Schomburgk, entitled "Remarks on the Greater Ant-bear (*Myrmecophaga jubata*)," was read. This paper commences with some general observations on the *Edentata* and *Monotremata*: the author then proceeds to give a detailed description of the animal under consideration. The following is an abstract of the remaining portion of the paper, or that which relates to the habits of the animal.

Dr. Schomburgk observes, that at a distance the Ant-bear appears to be a much taller animal than it really is, owing to the elongated and nearly erect hair of the mane, and also the erect manner in which it carries its large bushy tail. When walking, the outer portion of the fore foot is applied to the ground, and the long claws are then doubled inwards. It runs with a peculiar trot, and is not, as has been represented, slow in its movements and easily overtaken; for when chased it will keep a horse in canter, and does not tire readily. White Ants or Termites constitute its chief food. When the Ant-bear meets with one of the tumuli constructed by the White Ants, it immediately pulls the fabric down by means of its large strong claws, and when the Ants are thus exposed its long slender tongue is thrust out to collect them. The movements of the tongue, alternately being protruded and retracted, are so rapid, says Dr. Schomburgk, that it is no longer surprising how so large an animal can satiate its appetite with such minute insects. The Ant-bear is, however, an economist, and does not destroy more than he wants. When he finds that the Termites diminish on the surface, and every one seeks to escape in the numerous galleries of the ruined edifice, he uses his left foot to hold some large lumps of the nest, whilst with the right he leisurely pulls them to pieces.

With the Termites he swallows a considerable quantity of the material of which the Ants' nest is constructed. Of this fact Dr. Schomburgk assured himself by dissection, and he is of opinion that the substance of the nest serves as a corrector.

"It has been generally thought," says Dr. Schomburgk, "that the Ant-bear lives exclusively on Ants; this, however, is not the case. In one which I dissected a year ago, a species of *Julus* was found; and the avidity with which an adult one now in my possession swallowed fresh meat, which was hashed up for it, makes me believe that even in the wild state it does not satisfy itself exclusively with Ants, and, provided the food is of such a size that it can take it up with its moveable upper lip, it does not despise it."

"The Ant-bear makes neither nest nor burrow, its ample tail serving it as sole protection against the inclemency of the weather. One of its favourite positions when at rest, is to tuck up its feet under its belly, and to unite the two extremities almost close together; in which

position the tail covers the whole animal : at other times it cowers itself up like a dog when asleep, and the tail covers only the snout and part of the body. The female Ant-bear possesses two pectoral teats, and produces only one young at a time ; and as soon as this has received sufficient strength the mother carries it with her on her back, where it keeps itself firmly attached. The young animal remains with its mother for the space of a year, and as this is the period when she brings forth again, it is then obliged to shift for itself.

" If the mother be attacked, she defends herself valiantly : raising herself upon her haunches, she strikes with her sharp claws at the enemy ; this is chiefly done with the right foot, while the left rests on the ground ; but she quickly changes their respective positions when the attack is carried to the other side : the young one remains all the while clinging to her. If the danger increase, she throws herself upon her back, and strikes with both claws at her enemy*.

" I have been assured by a highly-credible person, that the Jaguar finds it difficult to conquer the Ant-bear, and the fight which ensues was described to me as characteristic. It happens frequently that both combatants remain dead upon the spot, or that one does not survive the other many hours. The force which the Ant-bear possesses in its fore feet is astonishing, and I have no doubt that it is well able to rip open the belly of its assailant ; nevertheless, I should scarcely have supposed that the Ant-bear proved formidable to the fiercest of American animals.

" A young one, estimated about four weeks old, was presented to me by Dom Pedro Ayres. While riding on horseback over the Savannahs, he discovered the parent with the young, and immediately gave chase. After she had kept the horse in full canter for half an hour, she found herself so closely pressed that she put herself in defence : my friend was ready with the lasso, and having thrown it dexterously over her, she was secured. To the last moment the young one had clung to the mother. There being only one person to assist him, he found it impossible to lead her to the fort, she was therefore secured to a tree on the Savannahs. Dom Pedro Ayres, however, carried the young one off, and brought it to me. We despatched a sufficient number of men in quest of the mother, but she had found means to get rid of the ropes, and had escaped.

" The young one measured over the forehead along the back, from the tip of the nose to the insertion of the tail, twenty-two and a half inches ; the tail was twelve and a half inches, and it stood nine and three quarter inches high. In lieu of the yellowish white of the legs, and the bands of the same colour, which give such a remarkable appearance to the adult, there were in the young animal gray hairs, tinged with white : in all other respects it resembled its mother in colouring.

* " If the Ant-bear should succeed in throwing its arms round its enemy, and in fixing its claws in the flesh, nothing can disengage it from its embrace ; the muscles grow stiff, and I have been told, without being able to vouch for its veracity, that in this situation both animals die."

"The young Ant-bear was quite wild at first, and sought for some dark corner in the room in which it was confined, in order to hide itself. When we approached it, it put itself immediately in defence like the adult ones, and struck out with its right paw, emitting at the same time a growl like that of an incensed puppy. After a few days, however, it became accustomed to its situation, and an Indian woman took upon her to feed it with milk and Cassada, and sometimes with White Ants. It soon showed great attachment to her, and followed her like a dog.

"It appeared to be of a very cold nature; not only the extremities, but the whole body felt cold to the touch, although we kept it wrapped up in a blanket. It preferred, however, to be nestled, and to be taken up, and on putting it down it emitted a whining but not unpleasant sound; when it did not succeed in attracting attention, and was not taken up again, the whining sound was raised to a harsh and grating noise. In following a person, it directed its course more by the smell than by sight, and carried its snout close to the ground. If it found itself at fault, it wheeled round at right angles upon the hind legs, and snuffed the air in all directions, until it found the right scent again. Of the dimness of its sight we had various proofs; it hurt itself frequently against objects that stood in its way, not observing them until it came in contact with them. Its power of smelling was exquisite, and it could discover its nurse, or any person to whom it had taken a liking, at a considerable distance. Upon these occasions it would immediately commence the whining sound so peculiar to this animal. It was an expert climber; it happened that I was one of its favourites, and whilst writing on my table it used to come softly behind me, and as soon as it was sure it had found me out, it climbed up my legs with great dexterity. Out of amusement we would frequently hold up its blanket, and it climbed up its whole length.

"When the Indian woman was not present, or was otherwise occupied, and did not pet the young Ant-bear, she used to throw some of the clothes she had worn, or her own blanket before it, in which it wrapped itself, and was pacified. This effect could not be produced by any other person's clothes. It showed its attachment by licking, and was very gentle and even sportive; we all prized it highly. It slept a great deal. We had it for nearly two months, and as it began to feed itself we had great hopes of rearing it; unfortunately we were unable to procure milk, and whether in consequence of the change of food, or some other cause, it gradually declined. I found it sometimes as cold as ice, and stiff, and although I recovered it repeatedly, it died one day during my absence.

"Its place had been meanwhile restored by an adult specimen, likewise a female. I shall never forget the interesting sight which this individual presented. Some of the Indians belonging to my party, whom I had despatched in quest of game, met it on the Savannahs, and wisely attempted to drive it towards San Joaquin without wounding it. My attention was first attracted by an immense hue and cry from the persons about the fort, and upon step-

ping out the first object which struck me was the Ant-bear, running in a kind of dog gallop towards the houses, and flanked on both sides by the red-skinned Indians, who were furnished with bows and arrows, which they were ready to discharge, should the animal break through their lines. Having arrived at the walls of the fort, it retreated in one of the corners which a bastion formed, and attempted to climb up by thrusting its nails into some of the larger interstices between the freestone of which the walls are built; it did not, however, succeed, and we managed to throw a lasso over it. The animal defended itself valiantly, and as the surrounding persons appeared to be afraid of it, it ran a fair chance of slipping the noose; some of the men more courageous than the rest threw it, however, on the ground, and another noose being fixed to one of its legs, it was secured, and safely lodged in the yard attached to our lodgings. In its endeavours to get rid of the rope, which passed round the rump, it chafed itself considerably, and we found it necessary to make a roomy pen, to which it was conveyed. It began to feed on the third day: we gave it Ants and farina; the latter, a preparation of Cassada root, it never refused. The Ants' nests in the neighbourhood of the fort were soon exhausted, and more in way of experiment than out of persuasion that the animal would eat it, some small pieces of fresh beef were placed before it; to our greatest astonishment it ate the meat with avidity, and has since been chiefly fed on fresh beef and fish. We observed that in the course of three weeks it evacuated only twice, and then very copiously; this was likewise the case with the young one; and before I noticed the same circumstance with the adult, I thought its death was partly caused by constipation.

"By kind treatment it soon became domesticated, and fed out of our hands. When not asleep, (in which state it used the same position as already related,) it rested entirely on its haunches, and stretching its long snout through the palings of its pen, it surveyed the surrounding objects, and snuffed the air.

"It even raised itself frequently, and without difficulty, to nearly an erect posture, and remained thus for some minutes; sometimes it sat with its fore feet crossed. In feeding, it kneeled as sheep and goats do. It attempted frequently to take up objects with its paws; in this manœuvre its long claws assisted wonderfully. In rising from its resting posture it used first to get upon its knees.

"When some meat was thrown before it, it expanded the lateral apertures of the nostrils, and seemed, by moving its flexible upper lip, as if it intended to seek out the most delicate morsels. It climbed up the palings of its pen with great agility, never using both of its arms at a time, but first one and then the other; and if it had taken hold sufficiently with its claws, it raised the whole body, and brought up the hinder feet. We may conclude from this feat upon the strength of the muscles of its fore feet. The great muscle of the arm, of one which we dissected, was two inches wide, and three eighths of an inch thick.

"I have already remarked how fond the young one was of climb-

ing, and this, coupled with what I have just now related, makes me not doubt that, if circumstances should require it, they climb trees in their wild state with the same agility.

" It secretes a liquid substance, transparent like water, which drops down almost constantly out of its nostrils and mouth; this is the more remarkable, as it used very little water. The Llama, without using much water, possesses likewise a superabundant quantity of saliva. I recollect, before the pen was finished, when lying in the sun, it perspired so profusely that its hair could not have been more wet had the animal been in the water. It is remarkable that the four individuals, and the young one which we secured at Fort San Joaquim, were all females; in no instance have we observed a male. What, then, is the natural question, becomes of the males? I can give no other answer than that the males are unproportioned to the number of females, and are, no doubt, much more shy. Those which we secured were caught during day; it issues, perhaps, from the dense forests only by night. A similar instance offers itself in the genus *Auchenia*, of which the males do not quit their pastures in quest of the females, and herds exclusively of females and males are met with; it is only during the rutting season that they mix, when the males combat for the females.

" If it could be substantiated that the number of males is considerably smaller than that of the females, in that circumstance would rest an additional ground for supposing that the extinction of its species, like those of the *Edentata* in general, is determined upon.

" The flesh of the Ant-bear is eaten by many of the native tribes, and also by the negroes, who consider its skin a great delicacy.

" The trivial name of the Brazilians for the *Myrmecophaga jubata* is *Tamandua Bandeira*; in the Lingua Geral, *Tamandu Assu*; the Wapeshana Indians call it *Barshema*; the Macusis, *Warisi-rima*; the Arowaaks, *Barem*; the Warows, *Hohitia*.

" Finally, I subjoin some detailed measurements which were taken from a female Ant-bear, immediately after her death.

	Feet. Inches.
Height from the highest part of the back	3 0
Height from the smallest part of the back to the sole of the hind foot	2 10
Length from the back of the skull to the insertion of the tail	3 7
Length of tail	3 6
Breadth of the tail (when its hairs are standing erect) across the middle	2 3
Ditto ditto near the root	1 8
Length from the point of the shoulder to the <i>malleolus</i> of the fore foot	1 8½
Girth of the fore leg below the point of the shoulder..	1 4½
Girth of fore feet immediately below the knee	0 8½
Length from the knee-joint to the <i>malleolus</i>	0 5
Length of sole of hind-feet	0 5½
Breadth of ditto	0 3½

	Feet. Inches.
Girth of the middle of the belly	3 0
Girth of body near the shoulder	2 6
Length from the tip of the snout to the posterior ex-	
tremity of the skull	1 3
Space between the base of the ears	0 3
Length of the ears	0 2 $\frac{1}{4}$
from the eye to the nostril.....	0 11 $\frac{1}{4}$ "

February 26, 1839.

The Rev. F. W. Hope in the chair.

A communication from the Bishop of Down and Connor was read.

In this communication (which was forwarded to the Society through W. Thomson, Esq., Vice-President of the Belfast Natural History Society) his Lordship gives an interesting account of a Philantombo Antelope (*Antilope Philantomba*, Ogilby) which his Lordship had had in his possession for a considerable time. The animal was brought from Sierra Leone by Frederick Wood Mant, Esq., who has lately presented it to the Society.

The animal presented to the Society, says his Lordship, "is said to be a native of a part of the country one or two hundred miles further inland. He is considered to be very rare even in that part of the world, so that little could be learned about him from the inhabitants, by whom, however, he appears to be known by the name of *Phillantombo* or Phillytombo; whence his late master has been in the habit of calling him Philly, and the animal has appeared sensible of the name being designed for him."

"He was landed in England in May 1837, and was thence brought to Down and Connor House, Belfast, Ireland, where he has lived till this present November 1838. He was probably full grown at the time of his arrival in Europe, for no alteration is perceptible in his size or height; he has been in perfect health the whole of that time, and, with the precautions taken for his warmth and safety, has not appeared to suffer even during the winter from a climate so different from that of his native country. The chief change noticed in him has been the loss of his teeth, which took place about Midsummer 1837, and again in 1838, somewhat later in the season; but neither time did he seem to suffer any inconvenience, except for about a fortnight, when he appeared to require softer food than beans and biscuit. He also lost the rough sheath, which covered his horns, by rubbing them against trees and posts, of which exercise he is very fond; as he is also of rubbing his cheeks against anything that will assist in removing the glutinous substance which exudes from the orifices under his eyes: for this purpose he is pleased with having his face rubbed by the hand, and he also seems to be gratified by a similar application between his horns. It should be added, that the points of his horns are extremely sharp, as has been experienced by those who have been standing near him when he has been in a playful mood, or who have had occasion to catch him in order to remove him to his night quarters; for although extremely gentle, and free from vice, he is at times too frolicsome to submit willingly to confinement, and is impatient of being taken up in the arms, when he utters a cry like a petted child. It has been remarked, in the case

of any wound being inflicted by his horns, that it has never been followed by inflammation, and has soon healed.

"It is a curious circumstance, to which it may be worth while to draw attention, that frequently when he has been sleeping, and even snoring, no one has been able to perceive that his eyes have ever been closed.

"His food has been various; slices of raw potatoes at first, when he came, was his favourite food; but since he has been tried with wheat, and *rick* beans, and with green branches of any tree, or withered leaves of any kind, he has not eaten of the potatoes at all. Every fruit he readily devours as well as flowers, such as china roses and tulips, or any other gay ornament of the parterre, which made it necessary to confine him to a portion of the garden where he could not help himself quite so freely to its best produce. He has been sometimes observed to dibble in the earth with his sharp hoof, and eat voraciously of the mould; and once, having got access to a plum tree, he swallowed so much of the fruit, stones and all, as to occasion considerable alarm for his safety, till he coughed up the stones quite clean, to the number perhaps of twenty or thirty. He is very fond of hard biscuit, and drinks often of fresh water. In short, a bit of biscuit and an apple have generally been given him as a treat every evening, but wheat and beans are his constant food.

"His evacuations are regularly three times in the twenty-four hours, never between seven at night and seven in the morning. The water only is offensive, or he might be the inmate of a lady's drawing-room, he is so perfectly tame and cleanly."

An account of the habits of the Chimpanzee was communicated by Lieut. Henry K. Sayers. "Bamboo, the Chimpanzee, now in the Zoological Society's Gardens, Regent's Park, and the subject of this sketch," says Lieut. Sayers, "was purchased, about eight months since, from a Mandingo, at Sierra Leone, who related that he had captured him in the Bullom country, having first shot the mother, on which occasions the young ones never fail to remain by their wounded parents. On becoming mine, he was delivered over to a black boy, my servant, and in a few days became so attached to him as to be exceedingly troublesome, screaming and throwing himself into the most violent passion if he attempted to leave him for a moment. He evinced also a most strange affection for clothes, never omitting an opportunity of possessing himself of the first garment he came across, whenever he had the means of entering my apartment, which he carried immediately to the Piazza, where invariably he seated himself on it with a self-satisfied grunt, nor would he resign it without a hard fight, and, on being worsted, exhibited every symptom of the greatest anger. Observing this strange fancy I procured him a piece of cotton cloth, which, much to the amusement of all who saw him, he was never without, carrying it with him wherever he went, nor could any temptation induce him to resign it even for a moment. Totally unacquainted with their mode of living in the wild state, I adopted the following method of feeding him, which

has appeared to succeed admirably. — In the morning, at eight o'clock, he received a piece of bread about the size of a halfpenny loaf, steeped in water or milk and water; about two, a couple of bananas or plantains; and before he retired for the night, a banana, orange, or slice of pine apple. The banana appeared to be his favourite fruit; for it he would forsake all other viands, and if not gratified, would exhibit the utmost petulance. On one occasion I deemed it necessary to refuse him one, considering that he had already eaten a sufficiency, upon which he threw himself into the most violent passion, and uttering a piercing cry, knocked his head with such violence against the wall as to throw him on his back, then ascending a chest which was near, wildly threw his arms into the air and precipitated himself from it. These actions so alarmed me for his safety that I gave up the contest, and on doing so he evinced the greatest satisfaction at his victory, uttering, for several minutes, the most expressive grunts and cries; in short, he exhibited on all occasions where his will was opposed, the impatient temper of a spoilt child; but even in the height of passion I never observed any disposition to bite or otherwise ill treat his keeper or myself.

“Although he would never object to be caressed or nursed by even a stranger, yet I never saw him evince the slightest disposition to make the acquaintance of any other animal. At the time he came into my possession I had two Patas Monkeys, and thinking they might become acquainted, I placed Mr. Bamboo in the same apartment, where he resided for five months, yet I never saw the least desire on his part to become even friendly; on the contrary, he showed evident anger and dislike at their approach. This strange attachment to the human race and manifest dislike to all others, I have always considered one of the most extraordinary features of this genus. His cunning was also remarkable. On all occasions where he thought he was unobserved, he would not fail to steal everything within his reach, for no other apparent purpose than to gratify a propensity for thieving: did he, however, even think you were looking at him, he would wait his opportunity with the greatest patience before he commenced depredations. In his habits, unlike the monkey tribe, he was exceedingly cleanly, never soiling his bed or any place near it; and even on board ship (during the warm weather) he never failed to seek the deck, unassisted, whenever the calls of nature required it. On being left by himself in his piazza he would invariably seat himself on the window-sill, which was the highest point he could attain, and commanded a view of the barrack yard as well as the interior of my bed-room; but at sun-set he would descend, enter a washing-tub, which he had of his own accord chosen as a sleeping-place, and remain there all night: as soon, however, as the sun rose, he would never fail to occupy his favourite position on the window-ledge. From this I should say, that trees are ascended by the Chimpanzees merely for observation or food, and that they live principally on the ground. Bamboo, at the time of purchase, appeared to be about fourteen months old, and from what I could learn from the natives, they do not reach their full growth till

between nine and ten years of age, which, if true, brings them extremely near the human species, as the boy or girl of West Africa, at thirteen or fourteen years old, is quite as much a man or woman as those of nineteen or twenty in our more northern clime. Their height, when full grown, is said to be between four and five feet: indeed I was credibly informed, that a male Chimpanzee, which had been shot in the neighbourhood and brought into Free Town, measured four feet five inches in length, and was so heavy as to form a very fair load for two men, who carried him on a pole between them. The natives say that in their wild state their strength is enormous, and that they have seen them snap boughs off the trees with the greatest apparent ease, which the united strength of two men could scarcely bend. The Chimpanzee is, without doubt, to be found in all the countries from the banks of the Gambia in the north, to the kingdom of Congo in the south, as the natives of all the intermediate parts seem to be perfectly acquainted with them. From my own experience I can state that the low shores of the Bullom country, situated on the northern shores of the river Sierra Leone, are infested by them in numbers quite equal to the commonest species of monkey. I consider these animals to be gregarious, for when visiting the rice farms of the Chief Dalla Mommadoo, on the Bullom shore, their cries plainly indicated the vicinity of a *troop*, as the noise heard could not have been produced by less than eight or ten of them. The *natives* also affirmed, that they always travel in strong bodies, armed with sticks, which they use with much dexterity. They are exceedingly watchful, and the first one who discovers the approach of a stranger utters a protracted cry, much resembling that of a human being in the greatest distress. The first time I heard it I was much startled; the animal was apparently not more than thirty paces distant, but had it been but *five* I could not have seen it from the tangled nature of the jungle, and I certainly conceived that such sounds could only have proceeded from a human being who hoped to gain assistance by his cries from some terrible and instant death. The native who was with me laid his hand upon my shoulder, and pointing suspiciously to the bush, said, 'Massa, Baboo live there,' and in a few minutes the wood appeared alive with them, their cries resembling the barking of dogs. My guide informed me that the cry first heard was to inform the troop of my approach, and that they would all immediately leave the trees or any exalted situation that might expose them to view and seek the bush; he also showed evident fear, and entreated me not to proceed any further in that direction. The plantations of bananas, pampaws, and plantains, which the natives usually intermix with their rice, constituting the favourite food of the Chimpanzees, accounts for their being so frequent in the neighbourhood of rice fields. The difficulty of procuring live specimens of this genus arises principally, I should say, from the superstitions of the natives concerning them, who believe they possess the power of 'witching.'

"There are authors who have, I believe, affirmed that some of the natives on the western coast term these animals in their language

'Pongos ;' but I beg leave to differ with them as to 'Pongos' being a *native* term. The Portuguese formerly monopolized the trade of the coast, and had large possessions there as well as in the East Indies, most of the capes, rivers, &c. bearing the names they gave them to this day. Now 'Pongos' I look upon to be a *Portuguese East Indian* term for a tailless monkey, and in consequence of their discovering a river in Africa, the banks of which were inhabited by vast numbers of this species, they called it 'Rio Pongos,' a name which it bears still. This I conceive to be the origin of the term, whilst on the coast I observed that all the natives in the neighbourhood of Sierra Leone, when speaking of this animal, invariably called him 'Baboo,' a corruption, I should suppose, of our term Baboon."

At the request of the Chairman, Mr. Ogilby proceeded to make some observations upon a new species of Monkey, now living at the Society's Menagerie, which he characterized as follows :—

PAPIO MELANOTUS. *P. cinereo-brunneus; capite, dorso, lumbisque sub-nigris; caudā brevissimā, nudā; facie, auriculisque pallidis.*

The specimen from which this description is taken is a young male, said to have been brought from Madras. It has at first sight a considerable resemblance to the common Barbary species (*Papio sylvanus*) both in general colour and in physiognomy, but differs materially in the blackish brown shade which covers all the upper parts of the head, neck, shoulders, and back. The face and ears are of a pale flesh colour, not unlike the shade which distinguishes extreme age in the human species ; the naked part of the paws is dirty brown, and the temples are slightly tinged with a shade of scarlet, which the keeper informs me spreads and deepens when the animal is feeding. The tail is about an inch long, very slender, and perfectly *naked* ; but whether the last circumstance be not accidental I shall not take on me to say ; it *appears*, however, to be the natural condition of the organ. The general colour of the sides, under parts of the body, and extremities, is that pale olive brown so common among other species of this genus, such as the Bhunder (*P. Rhesus*), the Maimon (*P. Nemestrinus*), &c., and the hairs are equally without annulations. The individual has all the liveliness, good-nature, and grimace of the young Magot (*P. Inuus* and *Sylvanus*) ; but, like that species, it will probably become morose and saturnine as it advances in age and physical development ; qualities which, indeed, are common to all the Papios, and pre-eminently distinguish them from the Cercopithecs, Colobs, and Semnopithecs.

A paper, entitled "Spicilegium Serpentium Indorum," was communicated by Dr. Theodore Cantor. This paper contains the following descriptions of

A. VENOMOUS SERPENTS*.

Genus TRIGONOCEPHALUS, Oppel.

TRIGONOCEPHALUS ERYTHRURUS. *Tri. supra lœlè viridis, squamis*

* Dr. Cantor's original specimens, drawings, and descriptions are in the possession of the Radcliffe Library, Oxford.

ovatis carinatis subimbricatis, caudâ cinnamomeâ, squamis lœvibus rhomboidalibus tectâ; abdomine flavo-viridescenti linea nigra serrata utrinque inclusa.

Scuta abdominalia 167.

Scutella subcaudalia 68.

Habitat. Delta Gangeticum.

Bright green above, with ovate keeled slightly imbricate scales; the tail cinnamon red, with smooth rhomboidal scales; the abdominal surface greenish-yellow, inclosed on both sides by a black serrated line.

TRIGONOCEPHALUS MUCROSQUAMATUS. *Tri. supernè griseo-brunnezens, annulis nigris albo marginatis, squamis ovalibus, semi-carinatis mucronatis, imbricatim tectus; subtus albidus, nigro punctatus.*

Scuta abdominalia 218.

Scutella subcaudalia 91.

Habitat. Naga Hills, Assam.

Brownish grey above, with black white-edged rings, covered with oval, half-keeled, pointed, imbricate scales; whitish beneath, dotted with black.

Genus BUNGARUS, Daudin.

BUNGARUS LIVIDUS. *Bung. supernè lividus, subtus albo-flavescens.*

Scuta abdominalia 221.

Scutella subcaudalia 56.

Habitat. Asám.

Blackish-blue above, yellowish-white beneath.

Genus HAMADRYAS,* Cantor.

HAMADRYAS OPHIOPHAGUS. *Ham. supernè olivaceo-viridis, striis sagittalibus nigris cinctus, abdomine glauco nigro marmorato.*

Scuta abdominalia a 215 ad 245.

Scuta subcaudalia a 13 ad 32.

Scutella subcaudalia a 63 ad 71.

Habitat. Bengal.

Hindustanee name: Sunkr-Choar.

Olive-green above, with arrow-shaped black stripes; beneath, glaucous marbled with black.

Genus NAJA, Laurenti.

NAJA LARVATA. *Na. supra brunnea, striis subflavis transversalibus variegata; disco annulo albo, larvæ haud impari, ornato, pone quem (a tribus ad quinque) annuli albi;—inferioris superficie pars anterior annulis albis, nigro-cærulescentibus alternis circumdata, pars posterior glauco iridescens.*

Habitat. Bombay, Calcutta, Asám.

Bengalee name: Doollah-Kewtiah Nág.

* Vide Proceedings of the Zoological Society, No. lxvi. p. 73.

Brownish, with numerous faint yellow transverse stripes ; the hood marked with a white ring, not unlike the form of a mask, behind which there are from three to five white rings ;—the anterior part of the lower surface with alternate white and bluish-black rings ; the posterior part iridescent-glaucous.

A young specimen of this serpent lives at present in the Society's Gardens in Regent's Park. The artificial temperature, 62° Fahr., in which it is kept appears to agree very well with the serpent, which in one respect offers a striking difference from the habits of this genus when kept in captivity in India, for the keeper informs me that it feeds occasionally upon living frogs and earth-worms, and that it drinks milk ; while those in Dr. Russell's and in my own possession in India, when deprived of liberty invariably refused to take any kind of food.

Genus ELAPS, Schneider.

ELAPS BUNGAROIDES*. *El. supernè lividus, striis sagittalibus albis cinctus ; infra albus alternè lividus.*

Scuta abdominalia 237.

Scutella subcaudalia 46.

Habitat. Chirra Punji.

Black-blue above, with white arrow-shaped stripes ; beneath, alternately white and black-blue.

ELAPS FLAVICEPS. *El. capite flavo, dorso nigro vittâ serratâ albâ cœruleo pallide nitente utrinque circumdato, caudâ flava lîncâ nigrâ mediâ divisâ ;—abdomine flavo linea nigrâ utrinque inclusa.*

Scuta abdominalia 275.

Scutella subcaudalia 45.

Habitat. Malacca.

The head yellow, the back with a serrate band on each side, shining with a pale sky-blue colour ; the tail yellow, divided in the middle by a black dorsal line ; the abdominal surface yellow, inclosed on each side by a black line.

On my late visit to Copenhagen, Professor Reinhard pointed out an undescribed species of *Bungarus* from Java, preserved in the Royal Museum of Natural History (MSS. Cat., No. 128), which exhibits the same distribution of colours as the *Elaps flaviceps*, viz. the head and tail of a light yellow, the back bluish-black, the abdominal surface light yellow, the scuta marked with a short black transverse band or check on each side.

ELAPS NIGROMACULATUS. *El. supernè pallide brunneo-rubescens, maculis nigris albo-marginatis, lineis nigris junctis ;—caudâ fasciis duabus nigris albo-marginatis cinctâ ; abdomine flavo albescenti, alterne livido, linea nigrâ serratâ utrinque inclusa.*

Scuta abdominalia 238.

Scutella subcaudalia 24.

Habitat. Sincapore.

* From its resemblance to *Bungarus cœruleus*, Daudin.

Pale reddish brown above, with black white-edged spots, united by black lines; on the tail two black bands with white margins;—the abdominal surface whitish yellow, alternately blue-black, inclosed on both sides by a black serrated line.

ELAPS FURCATUS*, Schneider, Var. *El. supernè pallidè brunneorubescens, lineā dorsali subflavā nigro serratim marginatā, caudā fasciis tribus nigris cinctā, abdomine flavo albescenti, lineā nigrā utrinque inclusō.*

Scuta abdominalia 238.

Scutella subcaudalia 24.

Habitat. Singapore.

Pale reddish brown, above with a light yellow dorsal line, with black serrated margins; on the tail three black bands; the abdominal surface whitish yellow, inclosed on each side by a black line.

Mr. Fraser exhibited a new species of *Corythaix*, which he proceeded to characterize as follows:

CORYTHAIX MACRORHYNCHUS. *Cor. rostro prægrandi aurantiaco, ad basin sanguineo; capite, cristā, collo pectoreque viridibus; cristā ad apicem albā, et purpureo notatā; lineā albā infra oculos excurrente; dorso alisque metallicè purpureis; primariis sanguineis nigro marginatis; caudā supernè metallicè viridi; femoribus caudāque subtūs nigris; tarsis nigris.*

Long. tot. 14 poll.; *rostri*, $1\frac{1}{4}$; *alæ*, 6; *caudæ*, 6; *tarsi*, $1\frac{1}{4}$.

Hab. —?

This species of *Corythaix* lived for some time in the Society's Menagerie, having been purchased from a dealer who was unacquainted with its locality.

Compared with the known species of the genus, it approaches most nearly to the *Corythaix Persa* of authors, but from this it may readily be distinguished by its smaller size; and the form, comparatively large size, and colouring of the beak. The colouring of the plumage also differs in some respects: like *C. Persa*, the head, neck, and breast are green, but the feathers on these parts are of a deeper hue than in that species; the feathers of the crest, instead of being simply tipped with white, having a white transverse line near the apex, but at the apex they are purple-black. Minute black feathers encircle the eye, and a white stripe extends from beneath the eye on to the ear. The beak is much arched above, and somewhat inflated at the base; the nostrils are very large, and not hidden, as in *C. Persa*, by the decumbent feathers, these extending only to the posterior angle of the nostril. The upper mandible is of a bright yellow colour, excepting all that portion which lies below and behind the nostrils, which is of a brilliant red colour; the lower mandible is of the same red tint, but tipped with yellow. Both mandibles present simple sharp-cutting edges, in this respect exhibiting a different structure from that observable in the allied species, *C. Persa* and *C. Buffonii*, in which the mandibles have their cutting edges

* Russell, II., No. xix.

serrated. The back and upper surface of the wings are of a deep purple-blue tint, exhibiting in certain parts greenish reflections. The primaries (with the exception of the first quill) and the secondaries (with the exception of the three or four innermost quills) are red, margined with black; the shafts of these feathers are also black. The outer primary is black, and the two or three following feathers are broadly margined externally with the same colour. All the wing feathers are black at the base; on the outermost feathers the black colouring occupies but little space, but in each successive feather it increases in extent. The feathers of the tail are of a very dark green colour above, inclining to black; beneath they are black, but exhibit indistinct purple reflections. The rump, upper and under tail coverts, thighs, and vent are black, obscurely tinted with purple or green in parts. The tarsi are black. The eyes are hazel, and the naked, or almost naked space around the eye, is of a crimson colour; not carunculated, as in *C. Buffonii* and *C. leucotis*.

A highly-interesting and valuable series of specimens of the Paper Nautilus (*Argonauta Argo*), consisting of the animals and their shells of various sizes, of ova in various stages of development, and of fractured shells in different stages of reparation, were exhibited and commented on by Professor Owen, to whom they had been transmitted for that purpose by Madame Jeanette Power. Mr. Owen stated that these specimens formed part of a large collection, illustrative of the natural history of the Argonaut, and bearing especially on the long-debated question of the right of the Cephalopod inhabiting the Argonaut shell to be considered as the true fabricator of that shell.

This collection was formed by Madame Power in Sicily in the year 1838, during which period she was engaged in repeating her experiments and observations on the Argonaut, having then full cognizance of the nature of the little parasite (*Hectocotylus*, Cuv.), which had misled her in regard to the development of the Argonaut in a previous suite of experiments described by her in the Transactions of the Giænian Academy for 1836.

As this mistake had been somewhat illogically dwelt on, to deprecate the value of other observations detailed in Madame Power's Memoir, Mr. Owen observed, that it was highly satisfactory to find that the most important of the statements in that memoir had been subsequently repeated and confirmed by an able French malacologist, M. Sander Rang. Mr. Owen then proceeded to recapitulate these points.

First, with reference to the relative position of the Cephalopod to the shell, Madame Power, in her memoir of 1836, describes the siphon as being applied to the part of the shell opposite to the involuted spire. M. Sander Rang, who made his observations on the Argonaut in the port of Algiers, after having had cognizance of Madame Power's experiments, states, in his memoir published in Guerin's '*Magazin de Zoologie*' (1837), that in all the Argonauts observed by him, the siphon and ventral surface of the Cephalopod

were invariably placed against the outer wall or keel of the shell; and the opposite, or dorsal surface of the body next the involuted spire.

Secondly, with reference to the relative position of the arms of the Cephalopod to the shell, and the uses of the dorsal pair of arms, usually called the "sails," Madame Power had described these velated arms as being placed next the involuted spire of the shell, over which they were bent, and expanded forwards so as to cover and conceal the whole of the shell, and from which they were occasionally retracted in the living Argonaut: she further made the important discovery that these expanded membranes were the organs of the original formation and subsequent reparation of the shell, and ingeniously and justly compared them, in her memoir of 1836, to the two lobes of the mantle of the Cowry. These facts are described as the result of actual observation; but Madame Power, entertaining the common belief of the action and use of the velated arms in the sailing of the Cephalopod, enters into considerations respecting their proportional strength in relation to that hypothetical office. The subsequent observations of M. Rang have fully confirmed the accuracy of Madame Power's description of the relative position of the so-called sails of the Argonaut to the shell; and he has published some beautiful figures illustrative of this fact.

Thirdly, M. Rang confirms the discovery of Madame Power as to the faculty possessed by the Cephalopod of reproducing its shell, but he was unable to preserve his captive Argonaut sufficiently long to witness the complete deposition of calcareous matter in the new substance by which the Argonaut had repaired the fracture purposely made in its shell.

There are other observations in the original memoir of Madame Power; as, *e. g.* with respect to the flexibility and elasticity of the living shell of the Argonaut; the great extensibility and pump-like action of the siphon in locomotion; the use of the velated arms in retaining the shell firmly upon the Cephalopod; the great voracity of the Argonaut; the constantly fatal results of depriving it of its shell: all of which statements are of great interest and novelty in the history of this problematical mollusc, and some of which likewise receive confirmation in the memoir of M. Sander Rang.

Notwithstanding, however, that so many additional facts had been thus brought to bear on the relations subsisting between the Argonaut-shell and its occupant, Mr. Owen observed that the leading Malacologists who advocated the parasitic theory, had reiterated their conviction of its truth; and even M. Rang, though evidently biassed by what he had observed in favour of the opposite view, yields so much to the authority of M. de Blainville, as to declare himself in a state of the most complete uncertainty on the subject:—“*Nous nous trouvons en ce moment dans la plus complète incertitude.*” *Loc. cit.*

In this state of the question, a collection of specimens of the Argonauts, such as Madame Power had submitted to the examination of the Zoological Society, was of the greatest importance, if

impartially and logically considered with reference to the points at issue, and Mr. Owen stated that, having studied this collection with much care, he should, in the first place, restrict himself to such observations and arguments as would naturally flow from an examination of the specimens themselves, apart from any history or statement with which they had been accompanied when first placed in his hands by Madame Power.

The collection of Argonauts,—Cephalopods and shells,—preserved in spirits, included twenty specimens, at different periods of growth, the smallest having a shell weighing not more than one grain and a half, the remainder increasing, by small gradations, to the common-sized mature individual.

Mr. Owen's first attention was directed to the relative position of the Cephalopod to its shell. In every case it corresponded to that which obtains in the Pearly Nautilus, *the siphon and ventral surface of the Cephalopod being placed next the broad keel forming the external wall of the shell, the dorsal surface of the body next the involuted spire or internal wall.* In most of these specimens the veined arms, which are nearest the involuted spire, were retracted; but in some of the larger examples they had been admirably preserved in a fully-expanded and flexible state, and in their natural position as envelopes of the shell.

A second fact, of considerable weight in the debated point of the parasitism of the Argonaut, was afforded by this collection, viz. that in ten of the younger specimens there were no ova in the shell, but *the body of the Cephalopod occupied the whole of the cavity of the shell, to which it accurately corresponded in form.* It was scarcely possible, Mr. Owen observed, to contemplate these specimens without deriving a conviction that the body had served as the mould upon which the shelly matter had been deposited; and with reference to the expanded membranes of the dorsal arms, to which the office of calcification was assigned by Madame Power and M. Rang, these, it should be remembered, were, in fact, essentially productions of the mantle and possessed the same structure. It was only in the smaller specimens, however, that the body filled the shell; when the ovary begins to enlarge, the body is drawn from the apex of the shell, and the deserted place is occupied chiefly by the mucous secretion of the animal until the ova are deposited therein.

Mr. Owen then reminded the members present, that in former discussions on the nature of the Argonaut, he had opposed to the parasitic theory an observation made by himself on a series of young Argonauts, of a different species from the *Arg. Argo*, all captured at the same time, and exhibiting different sizes and degrees of growth, viz. *the exact correspondence between the size of the shells and that of their inhabitants, every trifling difference in the bulk of the latter being accompanied with proportional differences in the size of the shells which they occupied**. Madame Power's collection of young Argonauts afforded the means of pursuing this comparison to a much

* Zool. Trans., ii. pt. ii. p. 115.

further extent, and Mr. Owen had not only done so in reference to their relative size, but had also weighed the shell and its inhabitant separately of each specimen, from the smallest up to that in which the ova were fully developed in the ovarium. The following tabular view was given of the weights and measurements of ten of the alternate specimens in this series.

	A	B	C	D	E	F	G	H	I	K
Weight of the Shell	grs. $1\frac{1}{2}$	grs. $3\frac{1}{2}\dagger$	grs. $3\frac{3}{4}$	grs. $4\frac{1}{8}$	grs. $7\frac{3}{4}$	grs. $16\frac{1}{2}$	grs. $17\frac{1}{2}$	grs. 18	grs. 19	grs. 46
Weight of the Inhabitant*	18	21	24	41‡	62	82 $\frac{1}{2}$	165§	179	214	384
Length of the Shell 	lines. 8	lines. 11	lines. 12	lines. $12\frac{3}{4}$	lines. 15	lines. $22\frac{1}{2}$	lines. 23	lines. $24\frac{1}{2}$	lines. 27	lines. 37

Mr. Owen stated, that the correspondence in the progressive increase of inhabitant and shell, though not strictly conformable, was so close, as to present, in his opinion, an insurmountable objection to the parasitic theory. In every instance the inhabitant of a larger shell weighed more than that of a smaller one, even where the difference in the weight of the shell was but half a grain; while the few irregularities observed in the progressive increase of the two could in each case be accounted for, either by the enlargement of the ovarium, which added to the weight, without a proportional increase to the superficies of the individual; or, on the other hand, to a more rapid increase in the thickness of the shell at the earlier periods of its growth, or to a greater development of the angular processes of the mouth of the shell, as an individual peculiarity. In a collection of young parasitic Hermit-crabs (*Peguri*) the smaller specimens are commonly seen in shells of various species, and frequently very disproportionate bulk; the contrary is the case in the young of the Argonaut. "Now these young Cephalopods (Mr. Owen observed) grow, like the rest of the class, with great rapidity; the differences in the size of many of the young Argonauts in question corresponded with differences of age of a few days at the ut-

* In each case the Cephalopod was removed from the shell, and both were placed on blotting-paper, to absorb the superfluous liquor; due care was taken to weigh each specimen under conditions as precisely similar as possible.

† The disproportionate ratio in the increase of the shell B arises from the additional portion of the shell being thicker and heavier in proportion to the previously-formed part, than in the subsequent periods of growth, so that the increase of weight is in a greater ratio than the increase of size.

‡ Clusters of ovisacs were conspicuous in D to the naked eye in the ovarium, which had already begun to expand under the sexual stimulus.

§ The ovarium has now begun rapidly to enlarge.

|| This admeasurement was taken in a straight line, traversing the longest diameter of the shell; it was found impracticable to give any constant admeasurement of the Cephalopod, in consequence of the varying state of contraction and form of its soft and changeable body.

most"; so that, if the accuracy of the above observations made by Mr. Owen on two series of two distinct species of Argonaut, be admitted, * "a Naturalist entertaining the parasitic theory, must be compelled to suppose that the young Ocythoë, or Cephalopod, is engaged in a perpetual warfare with the hypothetical Nucleo-branchiate constructor of the Argonaut shell, which shell, to produce the correspondences above described, the young Ocythoë must change two or three times a week, if not every day. And nevertheless, although each prolific Cephalopod of the Argonaut sends into the world hundreds of little ones that must be so accommodated, and although, on the parasitic hypothesis, hundreds of the hypothetical Nucleo-branchiate constructors of the Argonaut shell ought to swarm about the port of Messina, where Madame Power obtained the specimens with which she stocked her molluscous vivarium, and notwithstanding that M. de Blainville has called the special attention of Naturalist-collectors to the hypothetical true constructor of the Argonaut-shell, as a chief desideratum in Malacology; and lastly, notwithstanding this hypothetical Nucleo-branchiate mollusk ought, on M. de Blainville's theory, to be nearly allied to the *Atlanta* and *Carinaria*, and therefore a floating Pelagic species, generally to be met with on the surface of the ocean;—yet had it still evaded the observation of the numerous active collectors engaged in exploring the zoological riches of the Mediterranean in different parts of its coasts."

"It is in vain to repeat, with reference to the non-discovery of any other inhabitant of the Argonaut than the Cephalopod, 'Ce que ne peut être rangé au nombre des argumens, parceque ce qui n'a pas eu lieu jusqu'à un moment déterminé, peut se montrer le moment suivant'; that, 'what is a fact at the present moment, viz. the non-discovery of the hypothetical true constructor of the Argonaut, may be no longer a fact at the moment after.' Such an observation could only possess argumentative force in the absence of other facts showing the high degree of improbability that a floating Pteropod, or Heteropod, sufficiently abundant to have supplied all the Argonauts of the Mediterranean with their shells, could have escaped observation."

Mr. Owen then proceeded to state that he had dissected every specimen of Argonaut in the present collection in which the absence of ova in the shell left the sex doubtful, and that they all proved to be females; this fact rendered it allowable to conjecture that the calcifying brachial membranes, and consequently the shell, might be sexual characters and peculiar to the female. But, he argued, "the known paucity of males as compared with females in other species of Cephalopods, rendered the conjecture to a certain degree problematical. Should it, however, be hereafter proved that the

* They accord with the statement of Poli, and with the observations of M. Prevost, founded on a suite of specimens of the Argonaut from the size of one and two inches to three or four inches. These are quoted by M. de Blainville in his memoir of 1837 (p. 10), but without the deductions which I have drawn from the same facts.

male Argonaut possessed neither a shell nor the organs for secreting it, this fact would not render the hypothesis of the parasitism of the female, which does possess the calcifying membranes, at all the less tenable."

With respect to the shell of the Argonaut, Professor Owen observed, that "any argument founded on observations on the dried shells in cabinets, could tend only to mislead the observer. Madame Power's specimens having been recently collected, and preserved in alcohol of not too great strength, manifested much of the original transparency and elasticity of the living shell. It was obvious, therefore, that light would act in developing the coloured spots on the contained body of the Argonaut; and this fact is important in reference to the seventh argument in M. de Blainville's memoir of 1837, p. 4., in which he asserts that 'those parts of mollusks which are covered with a shell are constantly white or colourless, but the mantle investing the body of the Argonaut is highly coloured.' Now, if M. de Blainville's object had been to prove that the Ocythoë did not inhabit a shell at all, the force or purport of this observation would have been intelligible; but the question is not whether the body of the Ocythoë is or is not covered with a shell, but whether it makes or steals that shell. But perhaps the argument, founded on the supposed opacity of the Argonaut shell, was brought forward merely to prove, that up to a certain period of its existence the Ocythoë was naked, and that the Argonaut-shell was taken possession of only for some temporary purpose, as for oviposition. The observations, however, which I published in 1836 (Cyclop. of Anat., Art. Cephalopoda, p. 544), proved that the young Cephalopod of the Argonaut was provided with a shell prior to the period of oviposition, and that the body entirely filled the shell at that period. The present collection still more satisfactorily establishes the fact, that the Argonaut-shell is not assumed by the Cephalopod for a temporary purpose: for the shell which protects the young would be wholly inadequate as a nidus for the ova of the mature animal; and for what purpose, then, on the parasitic theory, is the shell assumed by the Cephalopod before its ovarium has received the stimulus of sexual development?"

In Madame Power's recently-collected specimens, the shell, after a few hours' soaking in water, regained so much of its original flexibility as to demonstrate its power of varying its form with the varying bulk arising from the respiratory and locomotive actions of the inhabitant*.

The inductions, therefore, which the present collection of Argonauts of different ages and sizes legitimately sustained, were in exact

* In M. de Blainville's Letter on the Parasitism of the Argonaut (1837), the following assertion is offered as the tenth argument: "La mode de locomotion et de respiration de ces animaux par la contraction et la dilatation alternatives du sac, ne permet pas d'admettre qu'il y ait adhérence de la peau avec la coquille, à moins que de supposer que celle-ci soit flexible et élastique, et suive tous les mouvements de celle-là, ce qui est bien loin de la vérité."

accordance with Madame Power's belief that the Cephalopod was the true constructor of the shell, while no contradictory inference had been, or could be, deduced from an examination of the specimens themselves.

With reference to the second suite of specimens, viz. the ova of the Argonaut in different stages of development, Mr. Owen entered into a detailed account of the new and interesting facts which they revealed. In the ova most advanced, the distinction of head and body was established; the pigment of the eyes, the ink in the ink-bladder, the pigmental spots on the skin, were distinctly developed; the siphon, the beak,—which was colourless and almost transparent,—and the arms were also discernible by a low microscopic power; the arms were short and simple; the secreting membranes of the shell were not developed, and of the shell itself there was no trace.

In the second memoir of 1838, published by Madame Power, it is stated that the young Argonaut is excluded from the egg, as such, but naked, twenty-five days after oviposition, and that in ten or twelve days more, she discovered that they had formed their little shell. Mr. Owen regretted that there were no specimens in the present collection exhibiting the commencing formation of the shell; these were still a desideratum: but he proceeded to say, that the observations on the development of the ova of the Mollusca in general, which science possessed, would be greatly overstated, if one per cent. of the known species of Mollusca were allowed to have been subjected to such examination; he could not, therefore, admit, or indeed understand, the philosophy of regarding the period of the development of a mere dermal production, like the shell, as being subject to so precise a law, that its non-appearance in an embryo-mollusk, prior to its exclusion from the egg-covering, was to be considered proof positive that such mollusk should never thereafter have the power of secreting a shell. Now it was evident, from the observation of Madame Power's specimens, independently of any statements respecting them, that the expanded membranes of the dorsal pair of arms are not formed until the development of the embryo has far advanced: if, therefore, these membranous arms be, as Madame Power states, the organs of the secretion of the shell, that shell may not be formed until after the exclusion of the young Argonaut.

The proof that the veined arms possess, like the expansions of the mantle of the Cypraea, a calcifying power, was afforded by the third series of specimens on the table of the Society. These consisted of six shells of the Argonaut, from which Madame Power had removed pieces of shell while the Argonauts were in life and vigour, in her marine vivarium. One of the shells had been removed from the animal ten minutes after the fracture; another Argonaut had lived in the cage two months after being subjected to the experiments: the remaining specimens exhibited intervening periods between the removal of a portion of the shell and its reparation. The fractured shell first described had the breach repaired by a thin transparent membranous film: the piece removed was taken from the middle of the keel. In a second specimen calcareous matter

had been deposited at the margins of the membrane, where it was attached to the old shell. In a third specimen, in which a portion of the shell had been removed from the keel, about two inches from the mouth of the shell, the whole breach had been repaired by a calcareous layer, differing only in its greater opacity and irregularity of form from the original shell. In the specimen longest retained after the fracture, a portion had been removed from the margin of the shell: here the new material next the broken edge presented the opacity characteristic of the repairing substance, but the transition of this substance into the material of the shell, subsequently added in the ordinary progress of growth, was so gradual, in the resumption in the repairing material of the ordinary clearness and striated structure of the shell, that it was impossible to doubt but that the reparation as well as the subsequent growth had been effects of the same agent. The repaired parts of the shell reacted precisely like the ordinary shell with nitric acid.

Mr. Owen then observed, that the specimens submitted to the meeting by Madame Power possessed in themselves the means of confirming or refuting her theory of the formative organs of the shell of the Argonaut: for if the shell were secreted, as in gastropods, &c., by the edge of the mantle covering the body, the new material by which the breaches of the shell had been repaired, should have been deposited on the inside of the fractured edge; but, on the contrary, it was clearly obvious in two of the specimens, that the new material had been laid on upon the outside of the fractured part—as it must have been, supposing the vela or membranous arms to be the calcifying organs.

Mr. Owen then recapitulated as follows, the evidence, which, independently of any preconceived theory or statement, could be deduced from the admirable collection of *Argonauta Argo* due to the labours of the accomplished lady who had contributed so materially to the elucidation of a problem which had divided the zoological world from the time of Aristotle.

1st. The Cephalopod of the Argonaut constantly maintains the same relative position in its shell.

2nd. The young Cephalopod manifests the same concordance between the form of its body and that of the shell, and the same perfect adaptation of the one to the other, as do the young of other testaceous Mollusks.

3rd. The young Cephalopod entirely fills the cavity of its shell: the fundus of the sac begins to be withdrawn from the apex of the shell only when the ovary begins to enlarge under the sexual stimulus.

4th. The shell of the Argonaut corresponds in size with that of its inhabitant, whatever be the differences in the latter in that respect. ("The observations of Poli, of Prevost, and myself, on a series of *Argonauta rufa*, before cited, are to the same effect.")

5th. The shell of the Argonaut possesses all the requisite flexibility and elasticity which the mechanism of respiration and locomotion in the inhabitant requires: it is also permeable to light.

6th. The Cephalopod inhabiting the Argonaut repairs the frac-

tures of its shell with a material having the same chemical composition as the original shell, and differing in mechanical properties only in being a little more opake.

7th. The repairing material is laid on from without the shell, as it should be according to the theory of the function of the membranous arms as calcifying organs.

8th. When the embryo of the Argonaut has reached an advanced stage of development *in ovo*, neither the membranous arms nor shell are developed.

9th. The shell of the Argonaut does not present any distinctly defined nucleus.

Mr. Owen finally proceeded to consider the validity of the best and latest arguments advanced in favour of the parasitism of the Cephalopod of the Argonaut, and commenced with those published in the Proceedings of the Zool. Society for 1836, p. 122.

"Mr. Gray states, 1st. 'The animal has none of those peculiarities of organization for the deposition, formation, and growth of the shell, nor even the muscles for attaching it to the shell, which are found in all other shell-bearing Mollusks; instead of which, it agrees in form, colour, and structure with the naked Mollusks, especially the naked Cephalopods.'

"To this statement it need only be replied, that the Cephalopod of the Argonaut possesses two membranous expansions, having the same structure as the calcifying processes of the mantle in the testaceous Mollusks, and which Madame Power and M. Sander Rang compare to the lobes of the mantle of *Cypraea*; and that the Cephalopod in question, instead of agreeing in structure with the naked Cephalopods, differs from them precisely in the presence of conspicuous and largely-developed organs, which present the closest correspondence in form and structure with the calcifying membranes of the Cowries and other testaceous Mollusks.

"2ndly. Mr. Gray asserts, 'that the shell of the Argonaut is evidently not moulded on the body of the animal usually found in it, as other shells are.'

"This assertion, like the preceding, is directly opposed to the fact. But at the time when it was recorded in our Proceedings, Mr. Gray had probably not examined the young Argonaut. Yet the analogy of other testacea might have indicated to him that it was essential to see the young Mollusk before the degree of correspondence between the animal and its shell could be definitely pronounced upon. Most shell-bearing Gastropods, like the Nautilus and Argonaut, withdraw their bodies in the progress of growth from the contracted apex by which their shell commenced, and differ accordingly in form from that of the original cavity of their shell. The mode in which the vacated part of the shell is dealt with in different Mollusks is extremely various, and reducible to no common law; in the genus *Magilus*, e. g. it is solidified: in some species of *Helix*, *Bulinus*, and *Cerithium*, the deserted part of the shell, after being partitioned off, is decollated: in the Nautilus, &c., it is camerated. Was it at all improbable that in the Argonaut some other condition of the vacated

spire of the shell should be manifested? Why should it not be made subservient to the generative economy of the species? Yet, because it is neither solidified, decollated, nor camerated, it is argued in the third place, that the Argonaut shell must have been secreted by some other Mollusk than the Cephalopod usually found in it.

"4thly. Mr. Gray observes, 'the young shell of the just-hatched animal, which forms the *apex* of the shell at all periods of its growth, is much larger (ten times) than the eggs contained in the upper part of the cavity of the Argonaut.' The argument here founded on a comparison of the size of the supposed nucleus of the Argonaut shell with that of the ovum of the Ocythoë, has been quoted with approbation by M. de Blainville; but granting that the shell of a testaceous Mollusk is always formed before the embryo is excluded from the ovum, (which, as I have already shown, is a postulate, and not an established law) the force of an argument for the parasitic theory, based on this postulate, wholly depends upon another assumption, viz. that the ovum of a Mollusk never enlarges after it has quitted the parent. Now, the first observation which the promulgator of this argument had the opportunity of making on one of our commonest littoral Testacea—the Whelk, proved to him that the molluscosous ovum in that species does enlarge after exclusion, and Mr. Gray was subsequently compelled to admit 'that the size of the nucleus would not offer any difficulty with respect to the Ocythoë being the maker of the shell which it inhabits*.'

"Whether the other arguments founded by Mr. Gray upon the form of the body, and the want of perfect adaptation or adhesion of the body to the shell, &c., are unanswerable, as that experienced Conchologist states that he considers them to be, must depend upon the degree of weight which the objections above advanced are allowed to carry.

"With respect to the conclusions as to the parasitism of the Ocythoë, drawn from observing the relation of the Cephalopod to its shell, their insufficiency depends upon the circumstance that in forming them the condition of the mature Argonaut has been considered as applicable to every period of its life, and the arguments Nos. 1 and 2 being founded upon that supposition, thereby fall to the ground. In the argument for the parasitic theory deduced from the development of the Argonaut shell, a general rule, applicable to an extensive primary division of the animal kingdom, is assumed from the result of extremely scanty observations, which are altogether inadequate to its establishment.

"In the Proceedings of the Zoological Society for 1837, Mr. Charlesworth proposed an argument in favour of the parasitism of the Ocythoë, which has the merit—not possessed by those above discussed—of being founded on the observation of a new fact in the natural history of the Argonaut, viz., that breaches in the shell were repaired by a substance agreeing in every respect with the original shell. Mr. Charlesworth has, however, since admitted that this fact is not

* Magazine of Natural History, New Series, 1837, p. 248.

valid as evidence of the parasitism of the Cephalopod ; and it is now proved that the transparent film observed by M. Rang to be deposited by the Ocythoë over the fracture of the Argonaut shell would have been converted into a true shelly material if the subject of his experiment had survived for a longer period.

" M. d'Orbigny*, on the other hand, derived from his observations of the *Argonauta hians* made during his voyage to South America, a belief in the fallacy of the parasitic theory ; the principal argument of novelty which he adduces is founded on the integrity of the delicate and flexible margins of the shell in which the supposed parasite was lodged. M. de Blainville has refused his assent to the validity of this argument on the grounds that the rightful owner of the Argonaut shell might have been very recently expelled from the specimens described by M. d'Orbigny. As I have elsewhere † considered this objection, I shall not dwell further upon it, but merely observe that the experiments of Poli and Ranzani adduced by M. d'Orbigny in evidence of the formation of the shell *in ovo* are more than suspicious, and are inadequate to enforce a conviction of the truth of the non-parasitic theory.

" The more recent arguments of M. de Blainville ‡ in favour of the parasitism of the Argonaut repose partly on statements which are not based on facts, and partly on the interpretation of actual facts. The false facts are the following : 1st. That the same species of Cephalopod is not always found in the same species of shell. 2nd. That the natural position of the animal in the shell varies, the back of the animal being sometimes next the outer wall of the shell, sometimes next the involuted spire. 3rd. That the animal does not occupy the posterior part of its shell—(this being true of the more mature animal only). 4th. That the form of the animal and of its parts offers no concordance or analogy with the shell. 5th. That the shell is too opaque to have permitted the influence of light in the development of the coloured pigment in the mantle of the Cephalopod of the Argonaut. 6th. That it is very far from being true that the Argonaut shell possesses the flexibility and elasticity requisite to harmonize with the locomotive and respiratory movements of the animal. 7th. That the animal suffers no appearance of inconvenience when deprived of its shell. 8th. That a Cephalopod has been discovered in the Sicilian seas like that which inhabits the Argonaut, but without a shell.

" With respect to the first six of these statements, it need only to be observed that they are abundantly disproved by the series of specimens now on the table.

" As to the seventh statement, its value will be manifest, when the account given by Mr. Cranch, on which it is founded, is carefully analysed and considered. Mr. Cranch's observations, as quoted by Dr. Leech, amount simply to this : ' When the Cephalopod (*Argo-*

* *Voyage dans l'Amérique Méridionale, Mollusques*, p. 10.

† *Zool. Trans.*, vol. ii. p. 114.

‡ *Annales d'Anatomie et de Physiologie*, Mai, 1837.

nauta hians, Solander, or *Ocythoë Cranchii*, Leech) was adhering, with the *vela* retracted, to the side of the vessel of sea-water in which it was placed, the shell could be removed : in other words, there was no muscular adhesion. ‘ In this state of captivity some of the Cephalopods lost the power of retaining hold of the shell ; one which had thus left its shell lived several hours, and showed no desire to return.’

“ Now had the Ocythoë been a parasite ;—supposing that it had ever before obtained its shell by placing its body in one ready-made ;—and had it been in the habit of repeating this act during its whole period of growth, as it must have done to produce the concordance in size which the observations of Poli, Prevost, Madame Power, and myself establish as a general fact ;—then the probability would have been greater that the Cephalopod would have returned to, and so manœuvred as to regain possession of, its shell : the observation of such a fact would have told as strongly for the parasitic theory as the phænomena witnessed by Mr. Cranch testify in my opinion against it. I have repeated Mr. Cranch’s experiment with a true parasite,—the common Hermit-crab of our coasts ; and I would invite any naturalist to remove a parasitic Pagurus from its shell, and place it with the empty shell in a basin of sea-water, and see whether the parasite will manifest no desire to return his body into its accustomed hiding-place. In my experiments the Pagurus lost no time in regaining possession of its shell. As Mr. Cranch’s Argonaut survived four hours without showing the least disposition to return to its shell, instead of concluding therefrom that it had stolen it, I infer that such a mode of acquiring a shell was totally foreign to its instincts and œconomy.

“ Mad. Power states that the constant result of depriving the Argonaut of its shell is a gradual loss of vital power and ultimate death within a few hours at furthest. The experiment of M. Sander Rang was followed by the same result.

“ With respect to the eighth statement, I must say that the weakness of the side of the question advocated by M. de Blainville is clearly betrayed by the dubious notice of the Ocythoë by M. Rafinesque having been pressed into the service of the parasitic theory in the disguise of an established fact. M. Rang* informs us that the entire description of the much talked-of Ocythoë, as given by its discoverer, is as follows : ‘ Appendices tentaculaires au nombre de huit, les deux supérieures ailes intérieurement, à sucoirs intérieurs, pedonculés, réunis par l’ailé latérale, sans aucune membrane à leur base’ ; and amongst other just observations on the inadequacy of this meagre indication, to the support of the theory that the Cephalopod of the Argonaut naturally existed without its shell, and was identical with the Ocythoë of Rafinesque, M. Rang adds that the description of the Ocythoë above cited is equally applicable to any of the species of Octopus, to which M. Féruccac had applied the term ‘ Vélifères.’

* Guerin’s Magazine, p. 31.

"I now come to the consideration of the arguments for the parasitism of the Cephalopod of the Argonaut, founded by M. de Blainville on undoubted or admissible facts. The first of these arguments reposes on the often-repeated statement of the absence of any organ for muscular adhesion in the Cephalopod of the Argonaut. I confess, that when I discovered the Cephalopod of the Nautilus to be fixed to its shell by two strong muscles, and that the corresponding muscles in the Argonaut were very feebly developed, and lost in the mantle, the absence of analogy between the two Cephalopods inclined me, in 1832, to consider as probable the parasitic theory; subsequently, however, the consideration of the absence of muscular adhesion in the Carinaria, and of any adhesion at all in the Annelides which secrete shells, deprived this argument of much of its force.

"Secondly, M. de Blainville observes that 'the muscular integument of the body of the Cephalopod is not thinner than that of the naked species, contrary to that which exists in all conchyliferous Mollusks.' But what Mollusk, we may ask, has its whole body covered with a shell so delicate, so transparent, so flexible and elastic, as is the shell of the living Argonaut*?

"The dorsal border of the mantle is not free," observes M. de Blainville. Granted: and this would be undoubtedly strong proof that the Cephalopod of the Argonaut did not secrete its shell, if it were not provided with other organs for the purpose. In the Pearly Nautilus, on the other hand, which has no veliferous arms, the dorsal border of the mantle is so produced that it can be extended from the involuted spire, which it habitually covers, over the whole exterior of the shell, just as the Argonaut invests its shell with the transparent films of the dorsal pair of arms: the analogy between these two testaceous Cephalopods is perfect as regards their relative position to the shell, but does not extend to their organs of secreting or of adhering to the shell†.

"The animal does not occupy the posterior part of its shell. This I have ranged in the category of false facts, because the statement is only applicable to the young animal. But granting it were true, as well might we argue the *Helix decollata* to be a parasite, because it does not, like *Magilus*, retain and fill with shelly secretion the deserted spire of its shells; or that *Magilus* was a parasite because it did

* M. d'Orbigny truly states, "Les coquilles de l'Argonaute n'ont pas la contexture vitreuse des Carinaires et des Atlantes; elles sont, au contraire, demi-cornées, flexibles; et nous n'en trouvons l'analogie dans aucun autre des Mollusques." Loc. cit. p. 11.

+ Messrs. de Blainville and Gray conceive me to be in error in the position I have assigned to the Pearly Nautilus in its shell, but their arguments on this point are based on the same hasty generalization that has led to the hypothesis of the parasitism of the Argonaut. Judging from the analogies which have been cited in support of their views, it would have been equally reasonable to have called in question the accuracy of the relative position which I have assigned to the soft parts of *Terebratula* and *Orbicula*, viz. with the ventral surface applied to one valve, and the dorsal surface to the other, because in the Lamellibranchiate bivalves one valve corresponds to the right, and the other to the left side of the animal.

not secrete *septa* at regular distances, like the Nautilus, or, *vice versa*, as argue the Argonaut to be a parasite because it fills its vacated spire with mucus and with eggs."

Finally, Mr. Owen proceeded to state in detail the points which still remained to be elucidated in the natural history of this most interesting Mollusk. Among other experiments he suggested that the young Argonaut should be deprived of one of the veined arms, and preserved in a marine vivarium, with the view to determine the influence which such mutilation might have on the future growth of the shell: but in proposing further experiments, and while admitting that the period of the first formation of the shell yet remained to be determined, Mr. Owen stated that he regarded the facts already ascertained to be decisive in proof that the Cephalopod of the Argonaut was the true fabricator of its shell.

March 12, 1839.

William Yarrell, Esq., in the Chair.

Mr. Ogilby communicated a portion of a letter which he had received from M. Temminck. It related to two species of Monkeys, *Colobus fuliginosus* and *Papio speciosus*; the former M. Temminck considers identical with the Bay-Monkey of Pennant, and he states that this opinion is founded upon its agreement with a coloured drawing now in his possession; this drawing having been taken by Sydenham Edwards from the specimen of the Bay-Monkey formerly in the Leverian Museum, and which is the original of Pennant's description.

The *Macacus speciosus* of M. F. Cuvier is stated by M. Temminck to be founded upon an immature specimen of a species of *Macacus* which inhabits Japan; the habitat of Molucca Islands given by M. F. Cuvier being founded upon error. The specimen was originally taken from Japan to Java, where it died; the skin was preserved, and M. Diard having obtained possession of it, sent it to the Paris Museum; and as there was no label attached, M. F. Cuvier imagined it to be a native of the place whence M. Diard had sent it.

Mr. Fox exhibited several birds, which he stated had formed part of an extensive collection made in Iceland by the Curator of the Durham Museum.

The second part of Dr. Theodore Cantor's paper, entitled "*Spicilegium Serpentum Indicorum*," was read. In this paper numerous new species of Indian serpents are thus characterized:—

B. *Innocuous Serpents.*

Genus CALAMARIA, Linné.

CALAMARIA SAGITTARIA. *Cal. partim cinerea, partim ferruginea, serie dorsali punctorum nigrorum, nuchā capiteque albicantibus, imagine sagittæ nigrae ornatis; corpore squamis lævibus imbricatim tecto; abdomine citrino, punctis lateralibus nigris, vittâ lividâ utrinque inclusa.*

Scuta abdominalia 224.

Scutella subcaudalia 69.

Habitat. Bengal, Tirhoot.

Partly ash-coloured, partly rusty-brown, with a series of black dots along the back; the head and neck whitish, with an arrow-shaped black mark; covered with smooth rhomboidal imbricate scales; the stomach of a citrine colour, with lateral black dots, and a blue black band on either side.

Vernacular name, Dóblee.

No. LXXV.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

CALAMARIA MONTICOLA. *Cal. olivaceo-fusca, collari lätè flavo, lineā dorsali albicante, abdomine citrino.*

Scuta abdominalia 125.

Scutella subcaudalia 44.

Habitat. Naga Hills in Asám.

Dark olive-brown, with a bright yellow collar and a whitish dorsal line; beneath of a citrine colour.

Genus CORONELLA, Boie.

CORONELLA ALBOCINCTA. *Cor. viridè-canescens, fasciis transversalibus albis nigro marginatis, quorum intervalla nigro punctata; scutis abdominalibus albo-flavescens, alternè fuscis.*

Scuta abdominalia 181.

Scutella subcaudalia 65.

Habitat. Chirra Púnji, Asám.

Greyish-green, with white transverse bands, edged with black, the intervals dotted with black; the abdominal scuta alternately yellowish-white and deep brown.

Asáme name, Patdei-hee.

CORONELLA VIOACEA. *Cor. violaceo-rubescens, squamis albo-marginatis, subtus margaritaceis.*

Scuta abdominalia 196.

Scutella subcaudalia 38.

Habitat. Rungpore.

Reddish violet; the scales edged with white; beneath pearl-coloured.

CORONELLA CYCLURA. *Cor. viridè-canescens striis nigris obliquis interruptis, abdomine margaritaceo, vittâ tristè cinereâ utrinque inclusa.*

Scuta abdominalia 179.

Scutella subcaudalia 43.

Greyish-green, with black oblique interrupted stripes; the abdominal surface pearl-coloured, with a deep ashy-grey band on either side.

Vernacular name, Tukkr-Bora.

Genus LYCODON, Boie.

LYCODON ATRO-PURPUREUS. *Ly. atro-purpureus albo nigroque marmoratus, abdomine margaritaceo.*

Scuta abdominalia 257.

Scutella subcaudalia 91.

Habitat. Mergui, Tenasserim.

Deep purple, marbled with white and black; beneath pearl-coloured.

LYCODON SUBFUSCUS. *Ly. subfuscus, abdomine albo flavescens.*

Scuta abdominalia 245.

Scutella subcaudalia 78.

Habitat. Bengal.

Light brown; yellowish white beneath.

Vernacular name, Chittee.

Genus **COLUBER**, Boie.

COLUBER DHUMNA. *Col. olivaceo-viridis, squamis nigro-marginalis, abdomine margaritaceo, scutis scutellisque nigro-clavatis.*

Scuta abdominalia 187.

Scutella subcaudalia 119.

Habitat. Carnatic, Orissa, Bengal, Nepal, Asám, Arracan, Tenasserim.

Olive-green; the scales edged with black; the stomach pearl-coloured, edged with black.

Vernacular name, Dhumna or Dhameen.

COLUBER PORPHYRACEUS. *Col. lœtè porphyraceus, lineis nigris transversalibus albo-marginatis, pone quas lineæ duæ nigræ dorsales, æquidistantes; subtus lœtè flavus.*

Scuta abdominalia 213.

Scutella subcaudalia 64.

Habitat. Míshmee Hills, Asám.

Bright porphyry-red, with black transverse lines edged with white, the posterior portion of the body with two black parallel dorsal lines; beneath light yellow.

COLUBER QUADRIFASCIATUS. *Col. supernè lœtè brunneo-viridescens fasciis dorsalibus iv. nigris, albo interruptis; infra flavus.*

Scuta abdominalia 248.

Scutella subcaudalia 82.

Habitat. Asám.

Above light greenish-brown, with 4 black dorsal bands interrupted with white; beneath yellow.

COLUBER CURVIROSTRIS. *Col. supra partim lœtè olivaceo-viridis, punctis et lineis obliquis albis nigritaque, partim æneus; abdomine subfuscus.*

Scuta abdominalia 220.

Scutella subcaudalia 85.

Habitat. Bengal.

Above bright olive-green, with white and black dots, and oblique bronze-coloured lines; beneath light yellow.

Vernacular name, Tukkr-Bora.

COLUBER RETICULARIS. *Col. supernè brunneo-nigrescens, annulis albidis reticulatis, contiguis et lineis ejusdem coloris transversalibus ornatus, caudâ brunneâ nigrescenti, alternè griso-flavescenti; infra griso-flavescens nigro-maculatus.*

Scuta abdominalia 222.

Scutella subcaudalia 75.

Habitat. Chirra Púnji.

Blackish-brown, with whitish confluent netted rings and transverse lines of the same colour; the tail alternately blackish-brown and yellowish-grey; beneath yellowish-grey spotted with black.

COLUBER BIPUNCTATUS. *Col. supra tristè vinoso-purpureus squamis albo bipunctatis, subtus albo-cærulescens.*

Scuta abdominalia 181.

Scutella subcaudalia 52.

Habitat. Bengal, Asám.

Deep claret-purple above; each scale with two white dots; beneath bluish-white.

COLUBER MONTICOLUS. Hodgson. *Col. supernè luteo-rubescens fasciis transversalibus nigris, scutis abdominalibus albo-flavescientibus nigro marginatis.*

Habitat. Nepál.

Reddish dun-coloured above, with black transverse bands; the abdominal scuta yellowish-white, with black margins.

Subgen. **HURRIAH**, Daudin.

HURRIAH SANGUVENTER, (COLUBER SANGUVENTER, Hodgson.)

Hur. supernè vinoso-purpureus æneo nitens, abdomine sanguineo.

Scuta abdominalia 207.

Scuta subcaudalia 14.

Scutella subcaudalia 85.

Habitat. Nepál.

Above claret-purple, with metallic lustre; beneath blood-coloured.

Genus **HERPETODRYAS**, Boie.

HERPETODRYAS PRIONOTUS. *Her. supra fusco flavescens, nigropunctatus, fasciâque dorsali serratâ nigricante; abdomine flavo, fasciâ serratâ nigricante utrinque inclusa.*

Scuta abdominalia 153.

Scutella subcaudalia 65.

Habitat. Malacca.

Above yellowish-brown, dotted with black, and with a serrated blackish dorsal band; the abdominal surface yellow, with a blackish serrated band on either side.

Genus **PSAMMOPHIS**, Boie.

PSAMMOPHIS CERASOGASTER. *Psam. fulvus aureo pallidè nitens, squamis hexagonis rhomboidalibus summis carinatis, cæteris*

lævibus tectus; abdomine ceriseo, linea læte flavâ utrinque inclusa.

Scuta abdominalia 149.

Scutella subcaudalia 60.

Habitat. Bengal, Asám.

Yellowish-brown, shining with a pale gold colour, with hexagonal rhomboidal scales, the uppermost of which are keeled, the rest smooth; the abdominal surface cherry-coloured, with a bright yellow line on either side.

Vernacular name, Lál Mitállee.

PSAMMOPHIS NIGROFASCIATUS. *Psam. supernè subflavo-rubescens fasciis latis transversalibus nigris, lineisque duabus barbatis dorsalibus ejusdem coloris, interstitium quarum nigro partim punctatum; abdomine albido.*

Scuta abdominalia 245.

Scutella subcaudalia 75.

Habitat. Sincapore.

Light reddish-yellow above, with broad transversal black bands, and with two barbed dorsal lines of the same colour; the interval between these dorsal lines dotted with black; the abdominal surface whitish.

Genus DENDROPHIS, Boie.

DENDROPHIS BOII.* *Den. supernè nigro-brunneus, vittâ dorsali subfuscâ, abdomine albo-flavescenti vittâ ejusdem coloris utrinque inclusa, rostro subobtuso.*

Scuta abdominalia 186.

Scutella subcaudalia 129.

Habitat. Bengal, Ceylon.

Brownish black, with a light brown dorsal band; the abdominal surface yellowish white, with a band of the same colour on either side; the rostrum subobtuse.

Vernacular name, Kálla Lawrýncia or Nawdúnga.

Genus DIPSAS, Boie.

DIPSAS FERRUGINEA. *Dip. supra ferrugineo-brunnea, nigro albo-que rarè maculata; abdomine ferrugineo-flavo, albo nigroque maculato.*

Scuta abdominalia 171.

Scutella subcaudalia 57.

Habitat. Asám.

Rusty-brown, with a few black and white spots; the abdominal surface rusty-yellow, dotted with white and black.

DIPSAS MONTICOLA. *Dip. supernè tristè fusca, striis aliquot nigris obliquis; infra flavo-brunneus.*

* Chrysopœla Boii, Dr. Andrew Smith.

Scuta abdominalia 193.

Scutella subcaudalia 82.

Habitat. Naga Hills (Asám).

Dull dark brown above, with a few black oblique stripes; beneath brownish-yellow.

Genus TROPIDONOTUS, Kuhl.

TROPIDONOTUS QUINQUE. *Tro. supernè griseo-brunneascens, nuchā numero Quinque (v.) nigro inscriptā, fasciisque duabus nigris dorsalibus, albo punctatis; abdomine flavo-albescenti, fasciā nigrā utrinque inclusō.*

Scuta abdominalia 259.

Scutella subcaudalia 97.

Habitat. Mergui.

Brownish-grey above, with the cypher V in black on the neck, and with two dorsal black bands dotted with white; the abdominal surface whitish-yellow, with a black band on either side.

TROPIDONOTUS MÆSTUS. *Tro. supernè tristè olivaceo-nigricans, subtus flavus.*

Scuta abdominalia 138.

Scutella subcaudalia 77.

Habitat. Bengal.

Dull blackish olive-colour above; yellow beneath.

Vernacular name, Kalla Mittálee.

TROPIDONOTUS SURGENS. *Tro. lœtè olivaceo-viridis, abdomine flavo linea nigrā serratā utrinque inclusō.*

Scuta abdominalia 148.

Scutella subcaudalia 23.

Habitat. Bengal.

Bright greenish-olive; the abdominal surface with a black serrated line on either side.

Vernacular name, Bahr.

TROPIDONOTUS PLUMBICOLOR. *Tro. supra plumbeus, fasciā sagittatā occipitali nigrā et albā fasciisque nigris serratis transversalibus, squamus altè carinatis tectus, mento albo, abdomine plumbeo.*

Scuta abdominalia 162.

Scutella subcaudalia 51.

Habitat. Malwa (Saugor).

Lead-coloured above, with an occipital arrow-shaped black and white band, and with black serrated transversal bands, covered with sharply-keeled scales; the chin white; the abdominal surface lead-coloured.

Genus CERBERUS, Cuvier.

CERBERUS CINEREUS. *Cerb. supernè cinereus fasciis nigris transversalibus, subtus albicans fasciā nigrā undulatā.*

Scuta abdominalia 143.

Scutella subcaudalia 59.

Habitat. Bengal.

Ash-coloured above, with black transverse bands; beneath whitish, with a black undulated band.

Vernacular name, Jál Ginthéa.

Genus HOMALOPSIS, Kuhl.

HOMALOPSIS OLIVACEUS. *Hom. supernè olivaceus lineis nigris inter squamas variegatus, abdomine albicante, linea medid nigra diviso, vittâ albo-virescenti utrinque inclusa.*

Scuta abdominalia 167.

Scutella subcaudalia 71.

Habitat. Bengal.

Olive-coloured above, variegated with black lines between the scales; the abdominal surface whitish, divided in the middle by a black line, and with a greenish-white band on either side.

Vernacular name, Metillee.

"The descriptions and figures of these serpents were made in India in 1835, 1836, and 1837. For the specimens from Asám I am indebted to the kindness of the eminent botanist Mr. William Griffith; for those from Chirra Punji, to the friendship of Mr. J. W. Grant, of Calcutta. I have also to acknowledge the liberality of Mr. Hodgson, the Hon. Company's Resident at the court of Nepál, who allowed me to publish the undescribed specimens in his collection of Nepálese serpents."

March 26, 1839.

William Ogilby, Esq., in the Chair.

Some specimens of Fishes, Crustacea, &c., which had recently been presented to the Society by the Rev. R. T. Lowe, Corresponding Member, were exhibited, and a letter from that gentleman, containing the names and some other particulars relating to the specimens, was read.

A letter from the Rev. Edward Law, dated St. Petersburgh, February 28th, 1839, was read. In this letter Mr. Law stated, that he would endeavour to procure for the Society a live Russian Elk.

A letter from Hanmer Warrington, Esq., Her Majesty's Consul-General at Tripoli, was also read. In this Mr. Warrington states, that he has procured many specimens of animals for the Society's Museum, and that he had in his possession two living Ostriches, which he would send to the Society as soon as he knew by what means they could be transferred.

April 9, 1839.

The Rev. F. W. Hope, in the Chair.

A letter was read, from P. L. Strachan, Esq., dated Sierra Leone, February 19th, 1839. It stated that he had sent two African Wood-cocks for the Society's Menagerie, and that having only just arrived at Sierra Leone, he had not yet had time to procure other zoological specimens for the Society.

A letter from C. B. Bidwell, Esq., dated Sierra Leone. January 14th, 1839, was read. In this letter Mr. Bidwell states that he had forwarded the skull of an Hippopotamus for the Society's Museum.

In a letter from J. Frembly, Esq., dated Gibraltar, January 30th, 1839, that gentleman states that he had forwarded for the Society the body of a species of Cat, from South America, which he thought would be acceptable for the purpose of dissection.

A letter from the Board of Management of the Saffron Walden Museum was also read. This letter begged the Society's acceptance of two specimens (a male and female) of the *Antilope Isabellina*, a specimen of the *Antilope grimmee*, and a skin of the *Bernicula cana*.

A collection of beautifully finished drawings of Tasmanian Fishes was exhibited to the Members present, these drawings having been sent to the Society by Dr. Lhotsky for that purpose. In a letter accompanying these drawings, Dr. Lhotsky stated that they had all been executed, under his own superintendence, from fresh specimens.

A new species of Hamster was exhibited by Mr. Waterhouse, and characterized as follows :

CRICETUS AURATUS. *Cri. aureo-fuscescens, subtus albidus : pilis mollissimis, suprad basin plumbeis, subtus ad basin cinereis : auribus mediocribus, rotundis : caudâ brevissimâ pilis albis ob-sitâ.*

	unc.	lin.
Longitudo ab apice rostri ad caudæ basin ..	7	6
caudæ	0	5
ab apice rostri ad basin auris	1	6
tarsi digitorumque	0	10
auris	0	7

Hab. Aleppo.

" This species is less than the common Hamster (*Cricetus vulgaris*), and is remarkable for its deep golden yellow colouring. The No. LXXVI.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

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fur is moderately long and very soft, and has a silk-like gloss : the deep golden yellow colouring extends over the upper parts and sides of the head and body, and also over the outer side of the limbs : on the back, the hairs are brownish at the tip, hence in this part the fur assumes a deeper hue than on the sides of the body : the sides of the muzzle, throat, and under parts of the body are white, but faintly tinted with yellow : on the back, and sides of the body, all the hairs are of a deep gray or lead colour at the base ; and on the under parts of the body, the hairs are indistinctly tinted with gray at the base. The feet and tail are white. The ears are of moderate size, furnished externally with deep golden-coloured hairs, and internally with whitish hairs. The moustaches consist of black and white hairs intermixed.

"The skull, when compared with that of *Cricetus vulgaris*, differs in not having the anterior root of the zygomatic arch produced anteriorly in the form of a thin plate, which in that animal, as in the Rats, serves to protect an opening which is connected with the nasal cavity : the facial portion of the skull is proportionately longer and narrower : in size there is much difference, the skull of *Cricetus auratus* being one inch and six lines in length, and ten lines in breadth, measuring from the outer side of the zygomatic arches."

April 23, 1839.

William H. Lloyd, Esq., in the Chair.

A letter was read from Dr. Weissenborn, dated Weimar, February 19, 1839. It accompanied a female specimen of the Hamster (*Cricetus vulgaris*), which he begged to present to the Society, and related to some longitudinal, naked (or nearly naked) marks which are observable on the hips of that animal.

These marks, Dr. Weissenborn states, are found in every Hamster, though usually hidden by the long fur which surrounds them, and the common opinion of the furriers (who have to cut them out and to repiece the skin) is, that they arise from friction. Being situated over the hip-bones, and therefore more exposed than other parts, the hair is worn whilst the animal is moving in its burrow. This is the opinion also of the earlier authors, but "is, however, erroneous, as remarked already by Dr. Sulzer, in his valuable monograph on this species, published at Gotha in 1774. These spots are visible the very moment the hair begins to grow, in the naked young, and they are the very places where the growth of the hair becomes first apparent. At this early stage of the animal's life, they appear on the inner side of the skin, when viewed by transmitted or reflected light, as two dark spots. When all the hair is developed the case is reversed, and these spots appear paler than the rest of the skin. Dr. Sulzer confesses himself to be quite ignorant of the part which these peculiar spots act in the economy of the animal, and no subsequent author has explained the subject. I imagine no person, after Sulzer, has turned his attention seriously to it, but it is to be wondered that he was not more successful, being an accurate and clever observer. The reason why the Hamster is furnished with these spots appears to me very far from being mysterious, and had the cause not been mistaken for the effect, I think anybody might have hit upon the idea, that nature had made the short, stiff, and closely adpressed hairs, to grow upon these spots of the Hamster's body, *which are most exposed to friction*, and at the same time contiguous to bone, that the hair and the skin might be competent to stand the wear and tear to which they necessarily are subjected in the narrow burrow of an animal, which is very brisk in its movements; and no doubt the skin, which gives rise to a different kind of hair, is of a different structure from the rest; and as this hair is more stiff, the skin which it covers is probably more callous.

"In the present state of the science of physiology, it may be impossible to state with sufficient precision the conditions on which the peculiar structure of the skin and hair, in these particular spots, depends. The relation in which the latter stand to the hip-bones by peculiar tissues may perhaps help to explain the circumstance, as

the neighbourhood of, and connexion with, bony structures, have an evident influence on the nature of the skin and its productions."

Mr. Waterhouse remarked, that the description which Dr. Weissenborn had given of the peculiar spots on the hips of the Hamster, caused him to suspect that they were glands, analogous to those observable in the Shrews, and might help the animals to distinguish each other in their dark burrows.

Mr. Charlesworth exhibited the nest, eggs, and young of the Cross-bill (*Loxia curvirostra*), from the neighbourhood of Farnham in Surrey, and read some notes, relative to their discovery, which had been communicated to him by H. L. Long, Esq.

The nest, it was stated, was lodged close to the central stem of a Scotch fir, about thirty inches below its highest point, at the base of the shoots of the year 1837 : it was supported beneath by five or six ascending lateral branches of the tree, which so completely concealed it, that it can scarcely have been perceptible from the ground, and it was the occasional visits of the parent birds which betrayed their retreat. Mr. Yarrell remarked, that the eggs very nearly resemble those of the Green-finches, but are larger and have a smaller portion of red colouring, and this not confined to the larger end of the egg. In the young birds the beak is straight, the under mandible shuts within the upper and does not cross it as in the adult.

Mr. Charlesworth also exhibited a bone of great size and curious structure, which he stated was in all probability a ray of the dorsal fin of a species of shark.

Mr. Waterhouse exhibited two specimens of a species of Lark from China, which had recently died in the Society's Menagerie, having been presented to the Society by J. R. Reeves, Esq. It was characterized as follows :

ALAUDA SINENSIS. *Al. suprà rufo-fusca, subtùs alba, fasciâ lata pectorali nigra; lined sordide albâ ab oculis, ad occiput extensâ; fronte, nucha, et humeris castaneis; remigibus primariis nigris, marginibus externis angustè fuscescenti-albis, remige primo illo externè marginato; caudâ nigra, rectrice utrinque externâ albâ, ad basin nigro lavatâ, proximâ utrinque albo-marginata; rectribus intermediis duabus fuscescentibus.*

Long. tot. 8 unc. ; rostri, $\frac{3}{4}$; alæ, 5; caudæ, $3\frac{1}{4}$; tarsi, 10 lin.
Hab. apud Sinam.

The Chinese Lark very much resembles, and is nearly allied to, the *Alauda Calandra* of authors, but differs in the following particulars. The beak is more compressed, and the upper mandible has two longitudinal grooves on each side, the upper one of which gives a keel-like edge to the culmen ; the tail is proportionately longer, the tarsi are shorter ; the feet are smaller, and the hinder claws, instead of being bent downwards, are slightly recurved*. In the co-

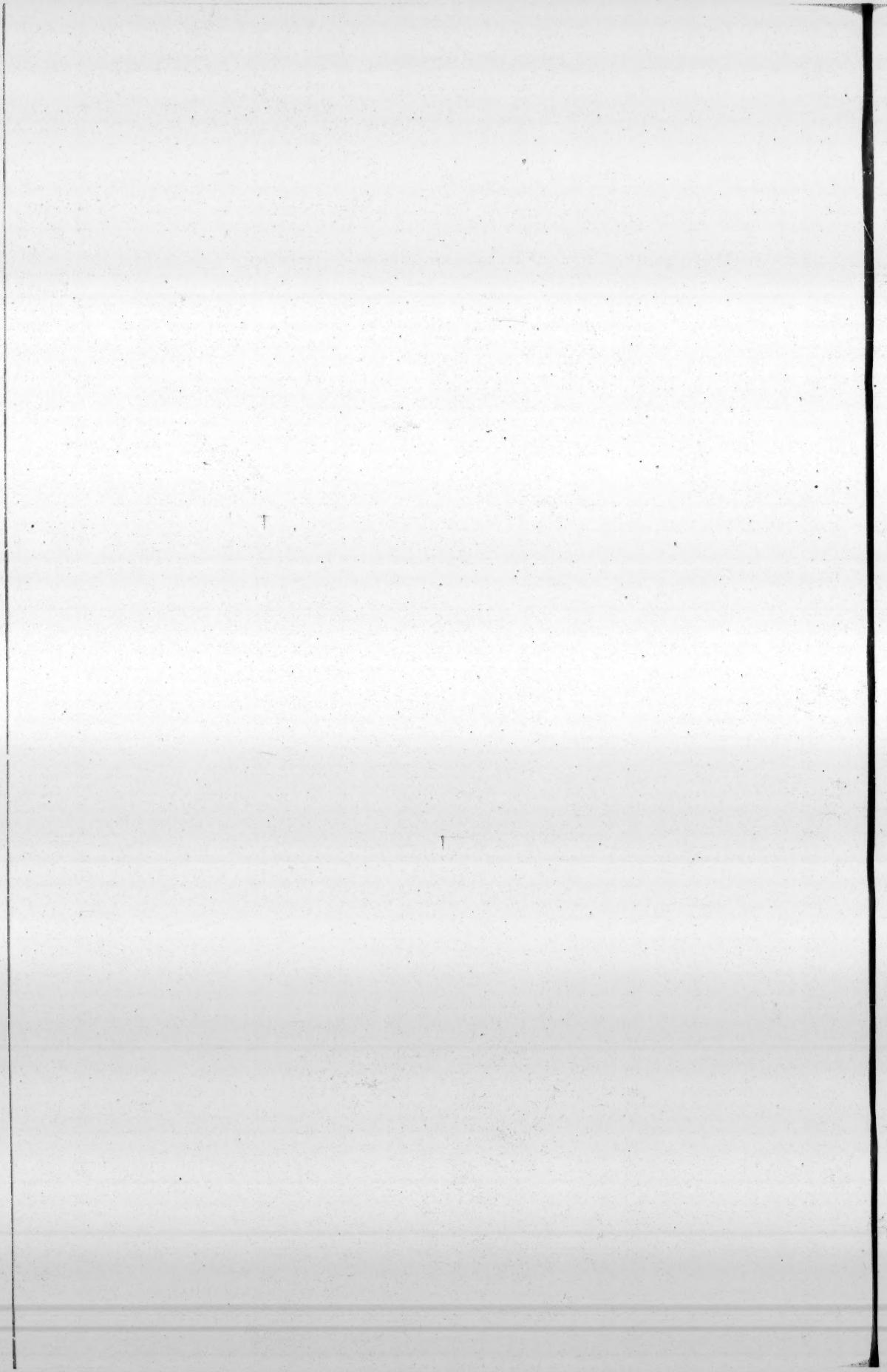
* "This difference in the form of the claw cannot be depended on, as the birds have been for some time in confinement; they may originally have been straight, but I think they never could have been curved downwards."

louring there are also points of distinction: in lieu of the dull brown tint on the top of the head and back, the present species possesses rich rufous brown feathers. In one specimen the body is yellowish white beneath, but in the other it is pure white.

Mr. Waterhouse then proceeded to make some observations upon a series of skulls of Rodents which were upon the table. These skulls belonged chiefly to species of the various genera contained in the families *Chinchillidae* (consisting of the genera *Chinchilla*, *Lagotis*, and *Lagostomus*), and *Caviidae*—composed of the genera *Cavia*, *Kerodon*, *Dolichotis*, and *Hydrochærus*. Numerous points of resemblance between these two families were dwelt upon, more particularly in the structure of the teeth, the form of the palate, the contracted glenoid cavity, the form of the lower jaw, and direction of the lower pair of incisors. The *Caviidae*, however, possess certain characters, independent of those observable in the form of the teeth, which renders it easy to distinguish them from the *Chinchillidae*. He alluded especially to the shortness of the condyloid process of the lower jaw, the forward position of the coronoid process, the peculiar projecting ridge on the outer side of the horizontal ramus, and the form of the descending ramus or angle of the jaw; this projects considerably beyond the line of the coronoid process, whereas in the *Chinchillidae* it terminates in a line with the posterior portion of the coronoid process, or projects but slightly beyond that line.

Among the *Chinchillidae*, the *Lagostomus trichodactylus*, observes Mr. Waterhouse, approaches most nearly to the Cavies, the angle of the lower jaw being less acute and the coronoid process more forward than in the other species.

In the imperfect state of the palate, the narrowness of the anterior and posterior sphenoids, the form of the occipital condyles, the form of the articular portion of the lower jaw, and the almost horizontal direction of the incisors of the lower jaw of the Chinchillas and Cavies, Mr. Waterhouse stated he had found characters which induced him to place those animals next before the *Leporidae*.



May 14, 1839.

Sir John P. Boileau, Bart., in the Chair.

A letter from Dr. Cantor was read. In this letter Dr. Cantor begs the Society's acceptance of a collection of Reptiles and Fishes from India, and states that this collection consists of about sixty specimens of Reptiles, and upwards of one hundred and fifty specimens of Fishes, a great portion of which are new species, and have been described by himself.

A letter from Allan Cunningham, Esq., dated Sydney, New South Wales, 26th November, 1838, was read. This letter accompanied the skin of an Apteryx, and also the body, preserved for dissection, which Mr. Cunningham had procured during a visit to New Zealand, and which he presented to the Society.

A paper communicated by Mr. Cunningham, and entitled "Rough notes collected from the New Zealanders (by aid of the missionaries), on the habits of the *Apteryx Australis*, a bird of New Zealand, closely allied to the *Struthionidae*, and named by the native inhabitants *Kiwi*," was also read. "This most remarkable bird," says Mr. Cunningham, "inhabits the densest and darkest forests. In those near the Kerikeri and Waimate missionary stations, a few miles from the shores of the Bay of Islands, it was formerly frequently observed and taken, as it is still to be found in the woods of the Hokianga river. It is however by no means confined to any particular district, for it is to be met with in all the wooded parts of the northern island. In these humid forests it reposes during the day, either beneath the tufts of long sedgy grass, a species of *Carex* everywhere abounding in the woods, or it hides itself, shunning the light, in the hollows at the base of the "Rata" tree, (*Metrosideros robusta* A. C.—n. s.) In these situations it constructs a very simple nest, laying, as all agree, but a solitary egg, which is about the size of a duck's, or as some natives assert, nearly as large as that of a goose, with which bird they are now familiar, the missionaries and other Europeans having some time since introduced it to their poultry-yards. Its period of incubation could not be ascertained from the natives. No sooner are its native woods darkened by the presence of night, than it ranges about in quest of food, which (as all accounts inform us) is exclusively worms, procured by burrowing with its feet, and perforating slightly the soft humid subsoil with its attenuated bill; and doubtless it is directed in the night by powerful instinct to the spots where these abound, for its eyes are very small, and its upper mandible, with the nasal orifices at its extremity or tip, possesses doubtless an acute sense of smelling.

"It is not gregarious, and but very seldom indeed to be seen in small numbers: generally they are in pairs (a male and female);
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and in the larger forests, less frequented by the natives, these pairs may be met with at distances of about a quarter of a mile.

"The cry of the *Kiwi* at night is similar to the whistling made by boys by the help of the fingers placed in the mouth,—a whistle with a hiss; and it is by imitating this sound that the natives decoy them, and either catch them by the help of dogs, or having induced the bird to approach near to them by the whistle, they suddenly surprise it by the glare of a lighted torch, which they have with them, concealed under their mats, when they seize it by the neck, and thus capture it alive.

"In this manner the bird, the skin and body of which are now sent to England, was taken and brought to me alive. It may here be observed, that the natives, when they proceed to the forest to capture these birds, choose the darkest night: and as the Kiwies usually wander about in pairs, the New Zealander readily distinguishing, by some difference of voice, the sexes, endeavours to secure the female first, since the male will always linger about the spot to protect its mate, and will thus give the natives a fair opportunity to capture it also.

"When alarmed in the forest, the *Kiwi* retires precipitately into its darker recesses, running with considerable swiftness; although its legs appear, from their shortness and strength, more fitted for burrowing than fleet movements.

"The legs afford the bird a means of formidable defence, for when hunted and overtaken by the small dogs and the natives, it uses its feet effectively: and it is said the dogs unskilled in the mode of seizing their prey have been greatly injured by its kick.

"Formerly, when the natives, wearing solely their loose, airy, mat-dresses, were altogether more hardy than they are in the present day, in which every man is rolled up in a thick, heavy double-blanket of our introduction among them, and has thus become, comparatively speaking, effeminate and inert;—formerly the natives were skilful "*Kiwi hunters*," delighting in the pursuit, and many a group would they form to go and pass a dark tempestuous night in the forest to decoy and catch these birds, the flesh of which, although said to be hard and sinewy, they greatly esteem. The feathers also were in request for making or decorating mats, by sewing them upon a groundwork of their native flax. Thus by their frequent night-prowlings in the woods, the natives have extirpated the *Kiwi* in some districts where it once abounded: and although it is still an inhabitant of timbered regions less disturbed by the natives, it is rarely to be obtained, because these people have become less energetic and enterprizing, and certainly less hardy by their adoption of the habits of civilized man than formerly, and therefore cannot often be induced, by a promise of reward however considerable, to spend a gloomy night in the forest, in search of the bird; and without the aid of the New Zealander it cannot be obtained.

"The skin now sent home, the natives said, was of a male bird, and certain it is that whilst living it had a very strong and highly offensive smell. Some natives of the country at East Cape, on the

coast, south of the Bay of Islands, who are residing with the Church missionaries at Paihia, on its southern shore, observed that the *Kiwies* of their forests are much larger and more powerful birds than my specimen taken on the Hokianga river. Might not those southern birds be of a distinct species?"

Mr. G. Smith exhibited several birds, which had been preserved, with all the parts entire, by a peculiar fluid, which was injected soon after the death of the animal. For this antiseptic fluid Mr. Smith has taken out a patent.

The Rev. F. W. Hope exhibited a portion of his collection of insects, in order to illustrate a paper entitled "A Monograph on Mr. William Sharp MacLeay's Coleopterous Genus *Euchlora*."

Genus EUCHLORA, MacLeay.

MELOLONTHA, Linn., Fab. & Olivier.

Antennæ articulis novem, basilari conico elongato, 2do, 3to, 4to, 5to et 6to brevibus subglobosis; capitulo ovato, triphylo, elongato, antennarum longitudinis totius haud dimidium æquante.

Labrum prominulum, clypeo fere absconditum, margine antico linearie, ciliato, emarginato, lateribus rotundatis.

Mandibulæ latitantes, subtrigonæ supra planæ, latere externo rotundato, interno ciliato, ad apicem 3-dentato.

Maxillæ caule subtrigono-triquetro, ad apicem inflexæ 6-dentatae.

Palpi maxillares articulo terminali cylindrico ovato.

Labiales articulis 2do et ultimo longitudine æqualibus hoc subulato.

Mentum subquadratum, margine antico emarginato angulis truncatis rotundatis ac lateribus sinuatis, postice valde convexis.

Caput subquadratum clypeo lateribus rotundatis margine reflexo.

Corpus ovatum convexum postice elytris haud opertum. *Thorax* subquadratus ad basin duplo longior quam latior, latere postico sinuato vix lobato.

Scutellum parvum cordato-truncatum. *Sternum* haud productum.

Pedes validiusculi tibiis anticis 3-dentatis. *Tarsorum* unguis posticorum indivisi reliquorum ex unguibus unus bifidus, alter indivisus.

"It is in the warm and tropical regions of the world that we find vastness one of the leading characteristics of animal life. It is in the same regions also, amongst the class of insects, that we find a corresponding magnitude attended with a wonderful increase of species, many examples of which might here be mentioned. It is sufficient for our purpose at present to note only a few of them, such as the *Sternocera*, among the *Buprestidae*; *Lamia*, belonging to the Longicorn beetles, and *Melolontha* and *Euchlora*, well-known genera pertaining to the Lamellicorns. With regard to vegetation, there will also be found an equal magnitude of stature and a luxuriance

of foliage quite in proportion to what occurs even in the animal world. If we look to the tropical regions of Asia, Africa, and America, we shall find a similarity of character generally predominating: but it is in the tropical jungle chiefly, and on the banks and estuaries of mighty rivers, that insects will be found, not only formidable by their size, but remarkably numerous in species and individuals. The genus *Euchlora* of Mr. MacLeay, to which at present I wish to draw your attention, is not very distinguished for its size, although larger than all the allied genera belonging to the family. The predominating colour is green, and the abundance of individuals belonging to some of the species is incalculable. I may mention, *en passant*, that the thousands which have annually been imported into Europe, appear from inquiry not in the least to have thinned their numbers. On one occasion I received forty Chinese boxes, and in each of them (I speak greatly within bounds) there were at least twenty specimens of *Euchlora viridis*. These boxes are imported into England, and other parts of Europe, in great quantities, and there is scarcely a museum at home or abroad, however insignificant it may be, but what it exhibits its Atlas Moths, its purple-coloured Sagra, and less attractive Euchlora, in tolerable profusion. I have stated above that the prevailing colour of the species is green, but there are some exceptions. The under side of some of them is usually a bronze, or a rose-coloured copper; some of them green above and beneath; others green above and yellow beneath; while some again are blue on the same side, with the play of light appearing of a violet colour. With regard to the colour of insects, greens, as far as my observations go, naturally on one side merge into blues and violets, and on the other into orange and yellows. Instead of occupying the time of the meeting with a question at present (as far as regards insects) comparatively little studied or understood, I proceed to remark on the geographical distribution of the family *Euchloridae*. Had some of the Continental entomologists been better acquainted with Mr. MacLeay's *Horæ Entomologicæ*, they certainly never would have considered *Euchlora* as an European genus. In a late work, published in Paris, the "Histoire Naturelle des Animaux Articulées" (at page 135), we find under the generic name *Euchlora*, not only *Mimela* and *Aprosterna* included, but also *Anomala*, &c. It is singular that the same appellation is given to twenty-two species therein specified, a short analysis of which I now place before you, and shall then allude more particularly to the genera composing the family, the range over which it extends, and mention the countries and localities in which they severally occur.

" Of the above twenty-two species, five of them appear to be true *Euchlora*, two others belong to *Mimela*, Kirby, another to *Rhombonyx*, Kirby, and the remaining fourteen to *Anomala* of Megerle, as it now stands. Before I conclude these remarks on the species of the genus before us, it is necessary to state that I have elevated *Euchlora* to the rank of a family, the following genera properly belonging to it.

EUCHLORIDÆ, Hope.

Genera.	Country.	Species known.
1. Euchlora, <i>MacLeay</i> . . .	Asia	30
2. Aprosterna, <i>Hope</i>	Asia and Africa. . . .	5
3. Mimela, <i>Kirby</i>	Asia.	22
4. Rhombonyx, <i>Kirby</i>	Siberia and China. . . .	2
5. Anomala, <i>Megerle</i> . . .	Old and New World .	120
		—
		179

Genus 1. EUCHLORA.

"The family of *Euchloridæ*, from the above table, consists of five genera, and nearly two hundred species, which have fallen under my notice. True *Euchlora*, I state, belongs exclusively to Asia and its isles. It occurs as far south as Manilla, appears at Singapore, and runs from thence through the continent of India up to the Himalaya; the extreme eastern point appears to be Japan, while its western range does not reach Bombay, probably from the intervention of some physical barrier. Captain Ezra Downes has taken it at Neemuch. The Entomology of that district essentially agrees in character with that of Calcutta and Madras, at the latter of which places *Euchlora* is taken.

Genus 2. APROSTERNA.

"This genus is not peculiar to Asia, as some of the species are found in New Guinea.

Genus 3. MIMELA.

"This elegant genus, rivalling in colour and splendour the *Buprestidæ*, is confined to Asia; it ranges wherever *Euchlora* is found.

Genus 4. RHOMBONYX.

"This genus is probably peculiar to Asia. One species is found in China, and the other, I have reason to think, is only found in Asiatic Siberia.

Genus 5. ANOMALA.

"Anomala is common to the four quarters of the globe, and may properly be divided into three if not four subgenera, which task I willingly leave to other entomologists.

"In concluding these observations on *Euchlora*, I have only to add, that it may excite some surprise that this genus extends far into the Himalayan regions; it may be explained however, satisfactorily, by the influence of local causes. It is an ascertained fact, that tropical vegetation often extends into high latitudes, and why, then, may we not expect to find insects which feed upon it, and are intended probably to keep it within due bounds?

"From information given to me by my friend Professor Royle, I state that the tropic-girt base of the Himalayas is characterized by a vigorous and luxurious vegetation.

" In the same regions there is also an uniformity or great equality of temperature, well adapted for animal as well as vegetable life. The exuberance of the latter adds to the humidity of the atmosphere, as well by the exhalation of the foliage as by preventing free evaporation from the soil. In the boundless forest and interminable jungle there will generally be found a great equality of temperature, brought about in consequence of the umbrageous shelter impeding the absorption of heat by day, as it checks the free radiation of it at night. It is then, owing to the presence of tropical vegetation, united with moisture, that there arises considerable uniformity of temperature : in a word, it is from local causes that we are enabled to explain the reasons why we meet with the representatives of tropical genera of plants and insects extending into higher latitudes than at first might naturally be expected."

Sp. 1. *Euchlora viridis*, Fabricius.

Long. lin. 12 ; Lat. lin. 7.

E. glabra, punctata, suprà viridis nitens subtùs cupreo-aurata, pedibus cupreis. Sternum haud porrectum.

Vide Oliv. Mel. Tab. 9. fig. 21^b.

Hab. in China.

Varietas *E. Elytris cupreo-marginatis, corpore suprà aeneo marginato, antennisque piceis.*

This species is found also at Singapore, Assam, in Bengal, and in the island of Ceylon. On the under side it is of a rose-coloured copper, appearing about the sternum and the lower rings of the abdomen of a brassy vivid green.

Sp. 2. *Euchlora Jurinii*, MacLeay.

Long. lin. 11 ; Lat. lin. 6.

E. nitidissima, glabro-punctata, suprà viridi-olivacea, subtùs viridi-cuprea, thorace utrinque punctis duobus impressis, pedibus viridibus, nitidis.

Antennæ piceæ 7mo articulo virescente. Totum corpus supra viride, aureo-opalino colore tinctum, infra viridi-aeneum, pedibus supra et infra viridibus.

Hab. in Java, Mus. Dom., MacLeay.

" I have received this species from Java ; it varies in size, and may at once be distinguished from *E. viridis* by its smooth upper surface, which is of an opalescent bright green ; its under side is also more brilliant, and of a golden-coloured bronze ; the tibiæ and tarsi are invariably green. The *E. MacLeayi* of Mr. Kirby's MSS. is only a large variety of this species."

Sp. 3. CUPRIPES.

Long. lin. 12 ; Lat. lin. 6 $\frac{1}{2}$.

Affinis Euchl. viridi, MacLeay, at major. Corpus ovatum ; suprà viride glabrum, subtùs roseo-cupreum, pedibus cupreis.

" This insect is closely allied to *E. viridis*, MacLeay ; it is, however, distinct. *Viridis* in form is oval. *Cupripes*, ovate : the under

side is of a rich rose-coloured copper, without any æneous tinge. I have received one specimen from Java, and a second from the Ténasserim coast."

Hab. in India Orientali. Mus. Dom., Hope.

Sp. 4. E. GRANDIS.

Long. lin. 14; Lat. lin. 8.

E. glabra, punctata supra viridis, nitens, subtus viridi-cuprea, thorace utrinque puncto laterali medio leviter impresso, pedibusque viridibus.

Hab. in Calcutta? Mus. Dom., Hope.

"I obtained this species from Calcutta; I am doubtful, however, if that be its real habitat. It is stuck with a needle, like most of the Chinese insects, and may have been imported into Calcutta. It is at present the largest species of *Euchlora* I am acquainted with."

Sp. 5. EUC. MACLEAYANA, Vigors.

Long. lin. $1\frac{5}{20}$; Lat. $\frac{9}{10}$.

E. pallide virescens, capite thoraceque punctis aureis confertis splendentibus; elytris punctatis flavo-marginatis; corpore subtus pedibusque aureo-cupreis.

Antennæ aureo-cupreæ. Corpus subtus pedesque aureo-cuprei, albidæ pilosi. Clypeus aureus. Scutellum nitidum, parce punctatum.

Hab. in Orientali. In Mus. Dom. Vigors.

"It is difficult to convey, either by description or representation, a just idea of the beauty of this superb insect, which was obtained from Madras. It was named by Mr. Vigors in honour of Mr. William Sharp MacLeay."

Sp. 6. E. SMARAGDINA, Eschcholtz.

Long. lin. $11\frac{1}{2}$; lat. lin. $5\frac{1}{2}$.

E. supra viridi-orichalcea; subtus, femoribus, thoracis pygidiique marginibus externis fusco-auratis, capite thoraceque dense punctulatis, elytris vase punctulatis seriebusque punctorum plurimis.

Hab. in Insulâ Luzonum, Manilla.

"The above insect I received from Dr. Eschcholtz*."

Sp. 7. E. SIEBOLDII.

Long. lin. $10\frac{1}{2}$; lat. lin. $6\frac{1}{2}$.

Affinis præcedenti; glabra punctata, supra viridis; thoracis lateribus marginibus fusco-auratis. Pygidium viridi-cupreum. Corpus infra roseo-cupreum, et nitidum. Pectus subargentea sericie obsitum. Pedes supra virides, subtus cupreo-aurati; femoribus cupreis et nitidis.

Hab. in Madagascar. Captus celeberrimo Macklotio.

This species is allied to *E. smaragdina* of Eschcholtz, but may at

* It has been reported that the above entomologist died of cholera: it appears however that he died of a bilious fever.

once be distinguished by the different colour of the *pygidium*, that of *smaragdina* being of a brilliant gold-colour.

Sp. 8. *EUCHLORA ALBOPILOSA*, Siebold.

Long. lin. 10; lat. lin. 5.

E. glabra punctata *suprà viridis subtùs roseo-cuprea et nitida albopilosa*, *femoribus tibiis tarsisque concoloribus*. *Caput viride antennis fusco-piceis*: *margines thoracis aurato-virides*. *Scutellum postice cupreum*. *Elytra lineis longitudinalibus impressa*, *sutura lâete viridis*, *marginibus e medio elytrorum ad apicem fusco-membranaceis*. *Corpus infra roseo-cupreum*, *albo-pilosum*. *Pygidium viride et tomentosum*. *Pedes cuprei*.

Hab. in Japonia.

"This singular insect was sent to me by my friend De Haan, of Leyden. It is remarkable for a dilated margin to the elytra, which appears to be membranous. The pubescence also of this species is singular."

Sp. 9. *EUCHLORA MARTINII*, Kirby's MSS.

Long. lin. 10; lat. lin. $5\frac{1}{2}$.

E. viridis, *capite marginibus thoracis auratis*, *elytris lineis duabus longitudinalibus fortiter impressis*. *Pygidium viridi-cupreum*. *Corpus infra roseo-cupreum*, *femoribus nitidis*.

Hab. in China?

This insect is evidently distinct from any species yet described; it is in a very mutilated state, no tibiæ and tarsi remaining. It is described from the Rev. William Kirby's collection, liberally given to the Entomological Society by that talented naturalist.

Sp. 10. *Euchlora bicolor*, Fab.

Long. lin. 9; lat. lin. 5.

Caput viride, *margine clypei rufescente antennis rubro-fuscis*, *glabra suprà viridis*, *subtùs testacea*, *pedibus apice aureis*. *Statura Eu-chloræ viridis at duplo minor*: *suprà tota viridis*, *glabra*, *obscura*, *immaculata*: *subtùs obscurior*, *testacea*, *æneo colore tincta*: *femora pallidiora tibiæ et tarsi aurei*, (Fab). *pygidio obscurè viridi*. *Variat colore supra viridi nitido*, *subtus aureo*, *et elytris interdum apice rufis*.

Hab. in Java.

"Fabricius described this insect from Sir Joseph Banks's cabinet, as a species from the Cape of Good Hope. Olivier copied the error, and figured one specimen, as obtained from the island of Bourbon. Both writers are in error as to locality, as the insect is peculiar to Java and the East Indian continent. Mr. Kirby has named the above species in his collection *E. Brightwellii*, which I regard only as a synonym of *E. bicolor*."

Sp. 11. *EUCHLORA PERPLEXA*.

Long. lin. 8; lat. lin. $4\frac{1}{2}$.

E. glabra, suprà viridis, subtùs pallidè testacea tibiis tarsisque roseo-cupreis. Affinis præcedenti at minor. Caput viride margine antico subrufo, antennis testaceis. Corpus supra viride, glabrum subtùs testaceum femoribus concoloribus, tibiis tarsisque roseo-cupreis, pygidio viridi, postice flavescente.

Hab. in agro Nepalensi.

"This species I received from my late lamented friend General Hardwicke, and for a long time I regarded it as the true *bicolor* of Fabricius. Professor De Haan of Leyden has lately sent me *E. bicolor*, Fab., from the island of Java; I have therefore been obliged to name an insect which I regarded as previously described. The species are closely allied, and might have puzzled any individual. The concise descriptions of Fabricius necessarily lead to error. It is of the highest importance, then, to obtain authentic specimens from sources which may be relied on, and I feel satisfied, that with regard to insects, unless the few authentic cabinets known are carefully inspected, little reliance can be placed on specimens, without they are named from comparison."

Sp. 12. EUCHLORA FEMORALIS.

Long. lin. 7; lat. lin. 4.

E. glabra suprà viridis, subtus rufo-testacea, femoribus flavis. Affinis E. bicolori at minor. Clypeus æneo-flavescens. Antennæ testacea. Thorax marginibus lateralibus concoloribus. Elytra suprà viridia, opalino, seu aureo colore tincta, apice bituberculata. Corpus subtus testaceum. Pectus sericie flavo obsitum. Femora flava; tibiis, tarsis, chelisque roseo-cupreis.

Hab. in Javâ.

"This species, by the kindness of Dr. Horsfield, I have described from the rich collection at the India House. It approaches in form the genus *Mimela*, Kirby. It is remarkable for its opaline play of colour, differing in that respect from all the species of my acquaintance."

Sp. 13. EUCHLORA DE HAANI.

Long. lin. 11 $\frac{1}{2}$; lat. lin. 6.

E. viridis, suprà glaberrima nitida, subtùs æneo viridis, nitido splendore conspicua. Caput viride, in medio aureo colore tinctum. Elytra glaberrima, sub lente vix subpunctata. Corpus infra smaragdino colore ornatum, lateribus pectoris argenteis pilis obsitis, segmentis abdominis utrinque pilosis et punctatis. Femora nitida, tibiis fortiter variolosis, tarsis chelisque viridibus.

Hab. in Assam.

"I have named this species in honour of my friend Professor De Haan, of Leyden, to whom European entomologists are greatly indebted for the additions made to many of their cabinets."

In Mus. Dom., Hope.

Sp. 14. EUCHLORA DIMIDIATA.

Long. lin. 11; Lat. lin. 6 $\frac{1}{2}$.

E. suprà tota viridis punctata, subtùs cyanea. Vide Gray's Zoological Miscellany, page 23, sp. 8, under *Euchloru dimidiata*.

Clypeus rotundatus, antennis, palpisque piceis. Thorax subtilissime punctatus. Elytra viridia opalino colore tincta, glabra nitida, striato-punctata striis parum distinctis. Corpus infra cyaneum, violaceo colore mixtum. Pectus pilis flavescentibus obsitum. Pedes cyanei.

Hab. in agro Nepalensi.

"This species was originally described by me among other Coleoptera belonging to General Hardwicke's superb collection, which has passed since his death to the British Museum."

Sp. 15. *EUCHLORA SULCATA.*

Long. lin. 10; Lat. lin. 6.

E. suprà viridis, punctata, elytris lineis fortiter sulcatis; corpore infra cyaneo.

Caput viride. Antennæ piceæ. Thorax utrinque in medio puncto impresso. Elytra binis lineis longitudinalibus fortiter impressa, seu sulcata, tertia fere humerali ante medium disci interrupta. Corpus subtus cyaneum pedibus concoloribus. Pectus ferrugineis capillis sparsim obsitum; annulis abdominis, pedibusque punctatis.

Hab. in agro Nepalensi.

"I received this insect from my lamented friend, General Hardwicke, and described it concisely some years back in Gray's Zoological Miscellany."

Sp. 16. *EUCHLORA SUBCÆRULEA.*

Long. lin. 10; Lat. lin. 5.

Totum corpus supra et infra subcyaneum. Antennæ fusco-piceæ.

Caput subquadratum. Oculi nigri iride pallenti. Thorax punctatissimus. Elytra substriato-punctata apice tuberculato. Corpus infra concolor. Pectus cum femoribus flavis capillis obsitum. Tarsi chelæque picei.

Hab. in Javâ.

"This singular species I am enabled to describe through the kindness of Dr. Horsfield, of the India House, who has liberally allowed me to describe some of the nondescripts of the Company's collection."

Sp. 17. *E. CUPREA SIEBOLDII.*

Long. lin. $11\frac{1}{2}$; Lat. lin. $5\frac{1}{2}$.

Caput clypeo subreflexo oculis nigris. Totum corpus supra æreum subtus roseo cupreum, nitidum. Caput et thorax punctulata. Elytra fovea impressa, obsolete striata, punctulata lineis vix distinctis, tuberculis apice conspicuis. Pygidium deflexum pilisque aspersum. Corpus infra roseo-cupreum nitidum capellis subflavis obsitum.

Hab. in Japonica.

"This insect I received from Professor De Haan, of Leyden, with Siebold's name of *Cuprea* attached to it, which I have consequently adopted."

Sp. 18. EUCHLORA CANTORI.

Lon. lin. 10; Lat. lin. $5\frac{1}{2}$.

Affinis præcedenti at minor. Caput antice rotundatum antennis piceis, oculisque albis. Totum corpus supra æreum, subtus roseo cupreum, coloreque rirescenti tinctum. Caput et thorax subtilissime punctulata. Elytra ærea, obsolete striata crebrissime punctulata. Corpus infra roseo-cupreum femoribus anticis piceo-rubris, colore nitidis, tibiis tarsis chelisque cupreis.

"This species inhabits Assam ; it was given to me by Dr. Cantor, in whose honour I have named it*."

Sp. 19. EUCHLORA COSTATA, De Haan.

Long. lin. $8\frac{1}{2}$; Lat. lin. $4\frac{1}{2}$.

E. ærea, thorace viridi, elytris costatis, corpore subtus roseo cupreo. Caput viridi-auratum antennis flavis oculisque albis. Thorax auratus viridique colore tinctus, longitudinali linea media fortiter impressa, crebre punctulatus. Elytra roseo-cuprea, sutura elevata, lineisque quatuor in singulo elevatis, interstitiis punctulatis. Pygidium flavum, in medio roseo-cupreum, æneo subpunctatum. Corpus infra concolor, marginibus thoracis utrinque flavis.

Hab. in Japonia.

"This species was sent to me by Professor De Haan, of Leyden ; it verges from the typical Euchloræ, and appears intermediate between *Euchlora* and *Anomala*. There is a variety of the above species which has the margins of the thorax yellow, and the elytra testaceous, as well as its under side and feet yellow. It is probably only an immature specimen."

Sp. 20. EUCHLORA AUREOLA.

Long. lin. 8; Lat. lin. $4\frac{1}{2}$.

E. aurato-viridis glabra nitida : corpus subius subtestaceum femoribus flavis, tibiis tarsisque roseo-cupreis.

Caput viride, antennis testaceis, oculisque fuscis. Thorax et elytra subtilissime punctulata virescentia auratoque splendore nitentia, marginibus posticis abdominis membranaceis. Corpus infra testaceum viridi æneo colore tinctum. Femora pallidiora tibiis tarsis chelisque roseo-cupreis. Pygidium obscure viride et punctulatum.

Hab. in India Orientali.

This beautiful species came from the Burmese territories ; it appears to be unique.

Mus. Dom., Hope.

SPECIES DUBIA.

Sp. 21. *Euchlora ærea*, Perty.Long. lin. 6; Lat. lin. $4\frac{3}{4}$.

E. brunneo-ænea, thorace subtilissime punctulato elytrisque obsolete striatis rugulosis.

* "The superb collection of drawings of *Reptilia*, made by Dr. Cantor whilst in India, is now deposited in the Radcliff Library at Oxford : it is to be hoped the University will publish them."

Statura et magnitudine fere E. Frischii, aliquantulum angustior.

Tota brunnea æneo-micans. Caput et thorax subtilissime punctulata. Scutellum disco impresso. Elytra irregulariter punctato-striata, rugulosa.

Hab. in Java.

I am in doubt if this insect can be considered as an *Euchlora*, being compared with *Anomala Frischii*; it may probably belong to that genus.

Sp. 22. *Euchlora cicatricosa*, Perty.

Long. 7"; Lat. lin. $3\frac{1}{4}$.

E. ænea elytris castaneis, cicatricoso-punctatis. Caput cupreo-æneum, punctulatum. Thorax æneus dense punctulatus, stria media lœvi impressa. Scutellum viridi-æneum, punctulatum. Elytra castanea, marginulo extremo æneo, substriato-punctata, punctis confluentibus cicatricosis. Antennæ et trophi picei: subtus cum pedibus ænea.

Hab. in Brasilia Australi. Prov. S. Pauli.

I am totally unacquainted with the above insect; I have given the description from the *Delectus Animalium Articulatorum*, the entomology of which was written by Professor Perty. I feel no hesitation in referring the above species to another genus, as I do not believe a true *Euchlora* is ever found in the New World.

Sp. 23. *Euchlora irrorella*, De Haan.

Long. lin. 7; Lat. lin. 4.

Punctuée, d'un brun-jaune clair, avec deux bandes longitudinales sur la tête, plusieurs autres mêlées sur le corselet, et une foule de petites taches transversales sur les élytres, noires; dessous du corps et pattes tachetés de noir. Java.

From the above description it appears probable that *Irrorella* belongs to the genus *Euchlora*.

Sp. 24. *Euchlora? strigata*, Castelnau.

Long. lin. $7\frac{1}{3}$; Lat. lin. 5.

D'un beau vert métallique, cuivreux, très brillant; bords latéraux du corselet d'un brun-jaunâtre métallique, avec un point vert au milieu; élytres avec des stries de points enfoncés, serrés, d'un brun-jaune clair, à reflets verts métalliques, avec plusieurs taches de cette couleur à la base, sur le milieu et à l'extremité; plaque anale jaunâtre, avec deux grandes taches d'un vert métallique sur les côtés.

Hab. Coromandel.

This and the foregoing species are described from a French work now in the course of publication, by the Count de Castelnau.

Sp. 25. *Euchlora trivittata*, Perty.

Long. lin. 5; Lat. lin. $2\frac{1}{4}$.

Subtus testaceo-metallica, thorace viridi, margine striaque media flavis, elytris testaceo-viridibus.

Statura omnino E. Frischii, sed satis minor. Subtus testacea, metal-

lico-nitida, abdomine obscuriore. Caput æneum, subtilissime punctulatum, clypeo reflexo. Thorax viridi-æneus, nitidus, margine laterali lato, vitta media flavis. Scutellum viridi-æneum, politum. Elytra longitudinaliter punctulata; testaceo-viridia. Antennæ brunneæ. Pedes metallico-testacei.

Hab. in Java.

In Museo Dom., Perty.

Sp. 26. *Euchlora splendens.* Schonherr.

Supra glabra, viridi-orichalcea, nitidissima, thorace elytrorumque dorso subtiliter parce punctulatis clypeo, reflexo integerrimo.

Hab. in China.

In Museo Dom., Schonherr.

It is probable that the above species is a *Mimela*. It is considered by Professor Perty to be an *Euchlora*. I have added Schonherr's short Latin description ; for more ample details consult the Appendix to Schonherr's 'Synonymia Insectorum,' tom. i, part 3, page 110.

Besides the above twenty-six species of *Euchlora*, there are several other insects which have been comprehended under that name ; for instance, *E. Dalmanni* of Schonherr, and *Chrysea* of Kollar, both of which are true *Mimelæ*, and allied to *M. fastuosa*, Fab. ; and to these may be added various species of *Anomala*, recorded by Fabricius, De Jean, and others. The latter writer, in his last catalogue of 1837, mentions the names of *E. piligera*, *Japonica*, *chalcites* : as he, however, confounds *Mimela* with *Euchlora*, little reliance can be placed on his authority ; they are, moreover, manuscript names, and no names ought to be adopted without published descriptions. I may add, that in the Dutch and other collections, about six others have fallen under my notice, making in all about thirty species ; which number no doubt will be considerably increased the more we become acquainted with the Entomology of Oriental India.

Mr. Waterhouse called the attention of the members present to some specimens of Quadrupeds presented to the Society by John Wray, Esq. These quadrupeds were procured at Minas Geraes, about three hundred miles from Rio Janeiro, and consist of two specimens of a species of Opossum, closely allied to *Didelphis Azaraæ*, a curious pale variety of *Gulo barbatus*, and a specimen of *Galictis vittata*, together with a Cavy and a Fox, which Mr. Waterhouse stated he believed were undescribed.

May 28, 1839.

William Ogilby, Esq., in the Chair.

A letter from C. B. Bidwell, Esq., dated Sierra Leone, February 22, 1839, was read. It stated that Mr. Bidwell had forwarded for the Society's museum the skull of a Hippopotamus, and skins of four species of monkey. "The Hippopotamus," says Mr. Bidwell, "is not found in the Sierra Leone River, but is very abundant in the Scarcies, which is about fifty miles distant."

A paper from the Rev. R. T. Lowe, entitled "A Supplement to a Synopsis of the Fishes of Madeira*", was read.

Fam. PERCIDÆ.

Genus CALLANTHIAS.

Gen. char.—Head scaly, except the short muzzle before the eyes; teeth as in *Anthias*, Bl.; preopercle perfectly entire; opercle with two flat adpressed spines; lateral line high up, near the back, and ending at the end of the dorsal fin, which is even or continuous; branchiostegous membrane with six rays.

CALLANTHIAS PARADISEUS. A most elegant little fish; in general habit and colouring resembling *Anthias sacer*, Bl., but without the produced third spine of the dorsal fin. Its analogies are singularly complicated, but its affinities are truly Percidous. By Bloch it might have been arranged either in *Bodianus* or *Cephalopholis*, Bl., but it is really inadmissible into any well-defined or constituted modern genus. It is almost as rare as beautiful.

Fam. BERYCIDÆ.

Genus BERYX, Cuv.

BERYX DECADACTYLUS, Cuv. *B. corpore ovali, lato, profundo, altitudine longitudinem capitum superante; dorso elevato, arcuato, gibbo; ventre prominente: basi pinnæ dorsalis elongata, pinnis pectoralibus haud breviore: oculis maximis: operculi angusti carina obscura: osse humerali angusto, margine posteriore recto, verticali.*

D. 4 + 18 — 20; Vs. 1 + 10; &c.

B. decadactylus, Cuv. and Val., Hist. III. 222.

B. splendens, nob. quad. icon. Tab. III. in Cam. Phil. Trans., Vol. VI. Part 1; haud textus.

When I published *B. splendens* as a new species in the Cambridge Transactions, I was unacquainted with the present fish, though it is scarcely perhaps less common than the former. I consequently did

* See Transactions of the Zoological Society, vol. ii. p. 173.

not discover till long after, that the figure intended for my *B. splendens* had been inadvertently taken by Miss Young from an individual of *B. decadactylus*, Cuv., of which it offers the more obvious peculiarities. The true *B. splendens*, therefore, yet remains unfigured, and till an opportunity presents of supplying this deficiency in the "Fishes of Madeira," I subjoin its true specific characters, contrasted with those of *B. decadactylus*.

B. SPLENDENS. *B. corpore oblongo, altitudinem capitidis haud æquante : dorso recto : basi pinnæ dorsalis brevi, pinnis pectoralibus breviore : oculis magnis ; operculi lati carina prominente : osse humerali dilatato, margine posteriore arcuato, obliquo.*

D. 4 + 13 — 15; V. 1 + 10 — 13 (1 + 11 fere); &c.

B. splendens, nob. Proceed. Zool. Soc. 1833. 1. 142. Cam. Phil. Trans. VI. 1. 197; excl. icon.—Syn. Mad. Fishes in Trans. Zool. Soc. Vol. ii. p. 174.

Trachichthys pretiosus, nob.

Hoplostethus mediterraneus, Cuv. and Val. IV. 496. t. 97. bis. Rariss.

This fish is unquestionably congeneric, if it is not even still more closely allied with *Trachichthys australis* of Shaw. Hence the above adoption of the older generic appellation, affording opportunity for the substitution of a less restrictive specific title; better suited to a fish: proved by the occurrence of two individuals in these Atlantic seas not to be peculiarly Mediterranean.

To the Sub-Percidous family *Berycidæ* belongs also *Polymixia*; nob. Cam. Phil. Trans. IV. 1. 198. t. IV.—Syn. Mad. Fish. pp. 178, 179.

Fam. TRIGLIDÆ.

Trigla lineata, L. Cuv. and Val. Hist. IV. 34.; Yarrell, Brit. Fish. 1. 46. Rariss.

A single individual only has occurred.

Fam. SPARIDÆ.

Pagellus rostratus, nob.—Syn. Mad. Fish. 177.

Reference to the excellently characteristic figures of Rondelet and Salviani has satisfied me that this is merely *Pagellus erythrinus*, Cuv. and Val.

Fam. CHÆTODONTIDÆ.

Pimelepterus Boscii, Lac.—"Cheiroco" or "Xarroco."—Cuv. and Val. VII. 258 t. 187. Rariss.

Fam. SCOMBRIDÆ.

Thynnus Albacora.—"Atum Albacora."—*T. corpore elongato, postice attenuato : pinna anali secundaque dorsali antice longe falcato-productis : pectoralibus ad medium secunda dorsalis attingentibus : ore oculisque parvis.*

Tunny, Penn. Brit. Zool. Ed. 1. iii. 266. No. 133. t. 52. excl. syn. An L'Auxide de Sloane, Scomber Sloanei, Cuv. and Val. Hist. VIII.

148; i. e. Albacore, Sloane, Hist. of Jam. 1. t. 1. f. p. 28? Sat. vulg.

The length of the narrow produced fore-part of the second dorsal fin varies from one-sixth to one-fourth part of the whole length of the fish; that of the pectoral fins is from one-fifth to one-fourth part of the same, and their tips reach to the middle of the second dorsal fin. Thus, in this latter point it is intermediate between the common Tunny (*T. vulgaris*, L.) and the following new species (*T. obesus*, nob.); approaching most the latter.

Pennant's figure is at least a tolerable representation of this very distinct species, agreeing with it in its main points of difference from the true *T. vulgaris*, L. It may be hoped that the attention of British Naturalists will be directed to this point. The proper season for the Albacora in Madeira is September and October.

THYNNUS OBESUS.—“*Atum Patudo.*”—*T. corpore abbreviato: obeso: pinnis acutis; pectoralibus ad finem secundæ dorsalis attingentibus: oculis magnis.*

Vulgaris.

This fish is constantly distinguished by the fishermen from the common Tunny or “*Atum Rabilha*” (*T. vulgaris*, L.) by the larger eye, and shorter thickset figure. The pectoral fins vary from one-fourth to nearly one-sixth part of the whole length, their points reaching to the end of the second dorsal fin. In *T. vulgaris*, L. the tips of the pectoral fins reach only to the end of the first, or to the beginning of the second dorsal fin.

T. obesus is in greatest abundance earlier in the summer than *T. Albacora*. In size it ranges next below *T. vulgaris*, L., not however attaining above half the extreme size of that species: nor much exceeding the full size of *T. Albacora*.

Thynnus Alalonga, Cuv. and Val.—“*Atum Avoador.*”—Cuv. and Val. Hist. VIII. 120. t. 215.

Orcynus Alalonga, Risso, iii. 419. Vulgaris.

No difficulty can occur in the recognition of this species, from the great length of the pectoral fins, which are one-third part of the whole length, and reach to the end of the anal fin, or to the first spurious finlet behind it. Its proper season is said to be January.

Thyrsites acanthoderma.—“*Escolar.*”

Aplurus simplex, Syn. Mad. Fish. 180.

This is the fish called in my Synopsis *Aplurus simplex*. It is a true *Thyrsites*, Cuv. in every respect, except the structure of the skin, a peculiarity which seems insufficient, in the absence of all other characters, to warrant its generic separation.*

Prometheus atlanticus, nob.—“*Coelho.*”

This also is again here mentioned only for the sake of remarking, that further observations have gone far to prove the Maderan fish to

* By an error in the punctuation, some descriptive observations at the bottom of page 180 of my synopsis (Trans. Zool. Soc., vol. ii.), relating to this fish, have been converted into a specific character.

be specifically distinct from both *Gempylus Prometheus* and *G. Solandri* of MM. Cuvier and Valenciennes, whose synonyms should therefore be expunged.

Gen. APHANOPUS, nob.

Gen. Char.—Form as in *Lepidopus*, elongate, much compressed, like a sword-blade, naked, but with a short keel on each side, towards the tail.

Muzzle and teeth as in *Lepidopus* (Gouan), but the palatines unarmed.

Dorsal fins two, nearly equal. Anal fin as in *Lepidopus*, but with a strong sharp spine instead of a scale before it, a little behind the vent. No trace or rudiment of ventral fins.

APHANOPUS CARBO.—“*Espada preta.*” Rariss.

Of this most curious new genus a single individual only has yet occurred. The whole fish is of a dark coffee colour, approaching to black, and has in form so close a general resemblance to *Lepidopus argyreus*, Cuv., that it might well be taken hastily for a mere variety of that fish.

Tetragonurus atlanticus, nob.

Differs from *T. Cuvieri*, Cuv. and Val., XI. 172. t. 318, chiefly in the longer head, much larger eye (nearly twice as large in proportion to the whole length), greater width between the eyes, teeth twice as numerous, in the upper jaw; thicker body, longer pectoral fins, higher (twice as high) first dorsal fin, and inequality of its spines. Having, however, seen only a single individual, I forbear to characterize it more distinctly; especially since of *T. Cuvieri* so few examples have as yet occurred; and that even MM. Cuvier and Valenciennes appear to have taken their figure from one which was imperfect in the caudal fin at least. The first dorsal fin is described by MM. Cuvier and Valenciennes as having fifteen spines; but twenty-one are figured in the plate.

The following is the fin-formula of *T. Cuvieri*, according to Risso; and MM. Cuv. and Val.:

“1st. D. 18; 2nd. D. 1, 12; A. 1, 11; P. 16; V. 1, 5; C. 36.”—Risso Hist.

“1st. D. { 15 in text, } 21 in fig. } 2nd. D. 1 + 13; A. 12; P?; V?; C?; B. M. 5.”—Cuv. and Val. Hist.

That of *T. atlanticus*, nob. is

1st D. 15; 2nd. D. 11; A. 11.; P. 16; V. 1 + 5; C. $\frac{7+VIII.}{7+VII.}$; B. M. 5.

The true affinities of this fish are certainly rather to be sought among the Mackerels (*e. g.* *Thryssites*) than the Mullets. Its relation to the *Mugilidae* is, indeed, one merely of a faint analogy.

Xiphias gladius, L.—“Peixe Agulha.”

The ordinary Sword-fish of Madeira is truly the common *Xiphias gladius*, L.

I have heard, however, of "another sort, with a bayonet or spit-like beak," called "Peto," which may perhaps have been a *Histio-phorus* or *Tetrapurus*.

SERIOLA DUBIA. Rariss.

A single individual only has occurred, which I am unable to identify with any of the species enumerated by MM. Cuv. and Val. The second dorsal fin is produced in front into a point; five eighths the depth of the body beneath. The sides of the tail are sufficiently distinctly keeled; and there is no temporal band. In the first of these characters it comes nearest *S. Rivoliana* or *S. falcata* Cuv. and Val.; differing, however, from both, principally in the points in which they are said to agree with *S. Dumerilii*, Cuv. and Val. With *S. Lalandi*, Cuv. and Val., it agrees in the two latter points above-mentioned; but differs in the produced second dorsal and anal fins; *S. Lalandi* appearing from MM. Cuvier and Valenciennes' description not to disagree in this respect with *S. Dumerilii*, Cuv. and Val. The individual described measured two feet and a half long.

Lampris lauta. For "Vertebris 69" and "Vert. 49," in the specific character and following formula of the *Lampris lauta*, p. 183. Of the Synopsis of Fish Mad. (vol. ii. Trans. Zool. Soc.), read, Vertebris 45; and in the seventh line of the next page, for "six vertebræ more," read "two vertebræ more."

Fam. CORYPHÆNIIDÆ.

Coryphaena hippurus, Cuv. and Val.? "Dourado macho."—Syn. Fish Mad. 183.

This fish agrees with *C. hippuroïdes*, Raf., according to the brief account transcribed by MM. Cuv. and Val., in having a row of larger dusky spots along the ridge of the back on each side at the base of the dorsal fin, which is itself immaculate, whilst the anal fin is also somewhat high and pointed in front. In these three points it is at variance with MM. Cuvier and Valenciennes' elaborate description of their *C. hippurus*, L. The individual described, however, by these consummate Ichthyologists was a male; whilst the only three which I have been able to examine closely, proved on dissection to be females, though commonly supposed by the Maderan fisherman to be the male of *C. equisetis*, L. Hence the Maderan fish, whether identical or not with the obscure and doubtful *C. hippuroïdes*, Raf., is for the present better referred to *C. hippurus*, L. Sufficient ground appears for the suspicion that the above differences may be only sexual. But were it otherwise, they would alone scarcely warrant its specific discrimination.

CORYPHÆNA NORTONIANA.—"Delfim."

This is a deeper fish than the preceding, in proportion to its length; with the front much steeper and bluffer; indeed, nearly vertical; the Dorsal fin beginning also somewhat forwarder. In the fin-formulæ, and number of the vertebræ (31), the two agree; and I have seen too few individuals at present to decide whether they really

are distinct, or only so in sex. But for its spotted body, I should be greatly tempted to refer it to the imperfectly known *C. imperialis*, Raf. (See Cuv. and Val., Hist. 9, 286.) In this uncertainty as to both rank and synonyms, less ultimate confusion will result from a distinct specific name, applied provisionally, than from a doubtful reference. It is therefore called after the Honourable C. E. C. Norton, to whose able pencil I was first indebted for a knowledge of the fish. Two other supposed individuals have since occurred, of which, however, one was unfortunately neglected, and the other had been two much injured by a blow, beating in the interparietal crest, to be fully satisfactory. This last individual, taken November 22nd 1838, was apparently a male; but I could not satisfy myself completely even on this point, and infer it only from my inability to discover any trace of the ovaria.

Coryphæna equisetis, L. 1, 447.—“Dourada,” “*D. femea*,” or “*D. amarella*.”—*C. equisetis*, Cuv. and Val., 9, 297, t. 267.

This may at once be distinguished from the foregoing species by its unspotted body, marked only by a few scattered, clear, but extremely minute black specks, very different from the diffused, pale, dusky, larger, spots of the preceding. The pectoral fins are also very short, the dorsal fin with fewer rays (53–55), the number of vertebræ greater (33), the form deeper and less elongated than even in the first species here recorded. It also is a smaller fish. Being our commonest species, I have seen numerous examples, but none exceeding two feet in length. The average length is very uniformly from twenty to twenty-two or twenty-three inches.

This fish, which is the commonest of the “Dourados” of Madeira, differs from *C. equisetis*, L., as described by MM. Cuv. and Val., under the name of *C. equisetis*, only in the head being rather longer than high, instead of higher than long, in the dorsal fin being lower in its highest part, and also lower *before* than *at* its hinder end; and lastly in the profile being oblique from the beginning, whilst in *C. equisetis*, Cuv. and Val., “il monte d’abord verticalement sur le tiers à peu près de son contou.” The first three discrepancies might well be merely due to slightly different modes of measurement. The latter is less easily accountable; for in this Maderan fish at least, of which I am well acquainted with both sexes, I find nothing to confirm M. Dussumier’s observation, that a greater height of the interparietal crest is characteristic of the male in *Coryphæna*. See Cuv. and Val. 12, Pref. p. vii.

Pomphilus Rondeletii, Will. 215, t. O. 1, f. 6.

Centrolophus pomphilus, Yarr. 1, 158.

— *pomphilus*, Cuv. and Val. 9, 334, t. 269.

— *morio* (Lacep.) Ib. 342. Rariss.

Two examples have occurred during the writing of this paper; the first was uniformly blackish, without spots or marks, thus answering to *Centrolophus Morio* of Lacepède: the second individual was smaller, and was marked precisely as in MM. Cuvier and Valenciennes’ figure (t. 269) of *C. pomphilus*.

I have no hesitation in uniting both these fishes, with their re-

spective synonyms, under the name long since applied by Willoughby to designate the species; although by him employed especially in reference to the second state or variety abovementioned, which also was the variety originally described by Rondeletius.

Pompilus Bennettii.

Leirus Bennettii, nob. in Cam. Trans. VI. 1, 199, t. V.—Syn. Mad. Fish, p. 179.

Centrolophus ovalis, Cuv. and Val. IX. 346.
crassus. Ib. 348.

The genus *Leirus* proves identical with *Centrolophus*, Lac., which in its turn, if not intolerable in itself (see Cuv. and Val. IX. 331.), must yield precedence to the prior claims of *Pompilus*, Rond. The species described by the Ichthyologist of Montpellier, (*Centrolophus pompilus*, Auct.) ought, on the other hand, as long ago by Willoughby, to be called *Pompilus Rondeletii*.

Brama Raii, Bl. “*Freira*.”—Syn. Mad. Fish, p. 179.

The true affinities of this fish are most assuredly Scombridal, or to speak more strictly, Coryphaenidal.

It was in reconsidering those of *Brama*, and in reaching this conclusion, that I was first led to detect the true affinities and synonyms of *Leirus*. It was not till convinced of the necessity of placing *Brama* next to *Pompilus* (*Centrolophus*, Lac.), that I discovered *Leirus Bennettii* to be a genuine species of this last-named genus.

So valuable are these studies of affinities; and thus do even errors often lead to valuable truth. I was not wrong, however, in associating *Leirus Bennettii* with *Brama*; but in not referring sooner it, or rather both, to the neighbourhood of *Pompilus*.

Fam. ZENIDÆ.

Zeus Faber.

Fam. MUGILIDÆ.

MUGIL MADERENSIS. “*Tainha de moda*.”

This is the fish published, in the former part of this list, under the name and with the synonyms of *M. Chelo*, Cuv. Comparing it, however, more closely with the description of *M. Chelo* in the eleventh volume of MM. Cuvier and Valenciennes' Histoire, I find the following principal discrepancies in the Maderan fish :

1. The produced scaly appendages at the base of the first dorsal fin extend considerably beyond the base of the fourth spine.
2. The maxillary is but very slightly S-like.
3. The upper lip is by no means peculiarly thick and fleshy, but rather the contrary.
4. It is a shallower, less deep fish in proportion to its length.
5. The tongue is altogether smooth, without any “asperités” whatever, at the edges or anterior end of the “arête,” which cannot be called “très-aigüe.”
6. The palate also is entirely smooth, not papillose near the vomer.
7. A conspicuous bright metallic brassy spot on the opercula, as in *M. auratus*, Cuv. and Val.

It differs, however, essentially from this last-named species, and

from *M. breviceps*, Cuv. and Val., in the exposure of the ends of the maxillary.

Fam. GOBIDÆ.

Having considerably extended my list of species, as well as rectified some errors in the nomenclature of others, I subjoin a complete enumeration of the Maderan species of this family hitherto discovered.

Blennius gattorugine, Will. Cuv. and Val. IX. 200. Will. Ichth. 132. t. H. 2. f. 2.—Yarr. 1, 226. Rariss.

A single individual only has occurred.

Blennius palmicornis, Cuv. and Val. XI. 214. t. 320. Syn. Mad. Fish 185. Vulgaris.

Blennius Artedii, Cuv. and Val. XI. 231. — *inæqualis* nob. Synops. Mad. Fish 185. haud Cuv. and Val. Rarior.

This is the little fish which, being formerly known to me only by a sketch, I had erroneously supposed to be referrible to *B. inæqualis*, Cuv. and Val. On better acquaintance it however proves their *B. Artedii*; and is indeed a most distinct and well-marked little species, scarcely exceeding two inches in length, and at once characterized by its active lively habits, its light tawny brown or yellowish olive colour, sprinkled all over with numerous minute white specks or dots, and the hollow, triangle-shaped, ciliate, occipital crest.

Blennius parvicornis, Cuv. and Val. XI. 257. Syn. Mad. Fish 185. Rariss.

Of this, as formerly of *B. Artedii*, I have no means of judging, except from some notes and a drawing taken by Miss Young, July 10th, 1835, during my absence from the island. My friend Mr. Yarrell has, however, examined the individual from which these were taken; and on his accuracy I rely entirely for the correctness of the above name or reference. I had before supposed it to be undescribed, calling it *B. strigatus*.

Pholis lœvis, Flem. Cuv. and Val. XI. 269. Yarr. 1, 230. Syn. Mad. Fish 185. Rarior.

I cannot help suspecting that MM. Cuvier and Valenciennes' Maderan specimen at least, discovered by my friend Henry Richardson, Esq., of Aber Hirnant, North Wales, of *Blennius trigloides*, Cuv. and Val. XI. 228, is really nothing but this state or variety of *Pholis lœvis*, which differs from the ordinary European fish only in having five or six distinct dark blotches or "demi-bands" along the back. I have hitherto met with no other fish beside the present answering at all to their description of *B. trigloides*; whilst this state of *Pholis lœvis*, although somewhat rare, is by no means so uncommon as to have been likely to escape Mr. Richardson's unwared assiduity.

Salarias atlanticus, Cuv. and Val. XI. 321. Syn. Mad. Fish 185. Vulgaris.

Tripterygion nasus, Riss. Cuv. and Val. XI. 409. Syn. Mad. Fish 185. Rariss.

Gobius niger, β . nob.

—, L. Syn. Mad. Fish 185.

Gobius Maderensis, Cuv. and Val. XII. 55. Rarior.

I believe this to be a mere variety or state of the common European *G. niger*, Cuv. and Val., analogous to the above-mentioned Maderan state of *Pholis laevis*, Flem.

GOBIUS EPHIPPIATUS, *G. fuscus, maculatus et punctatus : capite nuchaque nudis, hac sulcata : pinnarum pectoralium dorsariumque radiis haud productis : squamis magnis.*

D. 1^{ma}. 6 ; D. 2^{da}. 12 ; A. 11 ; P. 19 ; V. 5 ; C. $\frac{5 \text{ v. } 6}{5 \text{ v. } 6} + \text{XV}$;

B. M. 5. Rariss.

Of a nearly uniform brown colour, a little paler on the belly, with a row of darker rich brown patches along the sides, and above these numerous scattered smaller spots. Head spotted. The spots on the head and fore part of the body are ocellate, or surrounded by a ferruginous or yellow ring. The eyes are scarcely a semidiameter apart. The ventral fins are united, but by a very low membrane in front. Length of the only individual which has hitherto occurred, five inches. It appears sufficiently distinct from all the described European species by its naked head and nape.

Fam. LOPHIDÆ.

CHEIRONECTES BICORNIS. *C. hispidus, setis furcatis, nudus sexappendiculatus, pallide ruber, punctulis fuscis conspurcatus : fronte super oculos bicorni ; cornu anteriore distincto, recurvo ; posteriore gibboso-cristiformi ; filamento intermedio inconspicuo : brachiis pectoralibus ventralibusque exsertis.*

D. 12 ; A. 7 ; P. 10 ; V. 5 ; C. $\frac{1+1}{1+1} + \text{V}$.

A single individual only has occurred of this pretty little species, which in the foregoing characters appears distinct enough from all enumerated by MM. Cuv. and Val. ; approaching, perhaps, nearest to *Ch. furcipilis*, *pardalis*, or *coccineus*. It was only one and three-fourths of an inch long, and seven-eighths of an inch deep. The whole fish is strongly scabrous to the touch.

Fam. LABRIDÆ.

Crenilabrus caninus, nob. Synops. 186.

A most remarkable variety of this fish has the preopercle perfectly entire ; invalidating thus completely the generic character. This state of the species appears permanent, and independent of age or size ; whilst it is wholly unaccompanied by other marks of difference or indications of disease. It is rare comparatively with the normal form.

Crenilabrus luscus, nob. in Syn. Mad. Fish 187 ; nec Yarrellii nec Linnæi.

This also proves distinct from Mr. Couch's Scale-rayed Wrasse (*Acantholabrus Couchii*, Cuv. and Val. 13. 248), to which, as figured by Yarrell for the *Labrus luscus*, L. (a true *Labrus*, according to Valenciennes,) I had formerly referred it. A still nearer ally appears, however, to be *Acantholabrus Palloni*, Cuv. and Val. 13. 243

(*Crenilabrus exoletus*, Risso, haud *Labrus exoletus*, L.). From this it differs in the extension up between each of the spines of the dorsal and anal fins of generally four of the large scales into a curious distinct and moveable imbricated appendage; in the large dark spot or patch on the hinder end of the spiny portion of the dorsal fin; in having two dark spots on each side at the base of the caudal fin, one on the dorsal, and another fainter on the ventral line; and lastly in the general colour. In the first and last of these four points, it agrees better with *Acantholabrus Couchii*, Val. (*Crenilabrus luscus*, Yarr., Brit. Fish. 1. 300); but it differs in the other two, is only half the size, and whilst the dorsal and the anal fins have severally one spine less, the dorsal has one soft ray more.

LABRUS RETICULATUS.

This fish cannot be at present safely referred to the Ballan Wrasse of British Authors (*Labrus maculatus*, Bl.), Yarr. 1. 275; although in size and form of body, no less than in the peculiar lowness of the spiny portion of the dorsal fin, and abrupt production of the soft part of the same, and of the anal fin, as well as in the number of the rays of all the fins, there is a strong agreement. It will, I think, however, ultimately prove merely a dark variety of that species. The colour is peculiarly sombre; being a dark brown, approaching on the back almost to black; the whole beautifully reticulated with dark chesnut-brown lines, forming a border to each scale, and leaving the centre pale. The preoperculum was scaly. A single individual occurred in March 1838, and measured sixteen inches in length. Its fin-formula was,

D. 19 + 11; A. 3 + 9; P. 14; V. 1 + 5; C. $\frac{4+1+VI}{3+1+V}$; B. M. 5.

This individual has been deposited in the Society's collection.

JULIS MELANURA. *J. oblongus*, postice nigrescens: capite superne dorsoque olivaceo-fuscis: lateribus perpendiculariter strigatis; strigis posterioribus nigris cantibus: pinnae dorsalis antice altiores rudiis tribus primordialibus longioribus, operculique angulo lato truncato, basique primarum pectoralium cæruleo-nigrescente notatis: pinna dorsali analique fasciatis, basi nudis; caudali rotundato nigrante: squamis parvis: dente solitario majore ad canthum oris utrinque, antrorsum porrecto.

D. 9 + 12; A. 3 + 12; P. 14 v. 15; V. 1 + 5; C. $\frac{4+VI}{4+VI}$; M. B. 6;

Vert^x. 25.

Julis speciosa, nob. in Syn. Mad. Fish 186; haud Risso.

—, Cuv. and Val., Hist. 13. 375; quoad tantum exempla *Canariensa*, et forsitan *Maderensis*.

On re-examination and a close comparison of this fish with MM. Cuvier and Valenciennes' description of the true Mediterranean *J. speciosa*, of Risso, I find that it is properly distinct; although a Canarian individual at least of it has been referred by Valenciennes, as

the Maderan fish was formerly by me, to Risso's species. It differs chiefly in the elevation of the three first rays of the dorsal fin, the spot on which is small, not large; in the deep blackness of the caudal fin and hinder part of the tail or body; and, lastly, in being of considerably larger size (8–10 inches in length) than the true Mediterranean *J. speciosa*, Riss. Not having met at present with any other fishes in Madeira which agree so nearly as *J. melanura* with that species, I cannot help suspecting that in M. Valenciennes' Maderan specimens of his *J. speciosa* may exist the principal peculiarities which he has expressly noted in Mr. Webb's Canarian example, and which are precisely those of *Julis melanura*.

ACANTHOLABRUS IMBRICATUS. *A. pinna dorsali analique basi squamosis; squamis subquaternis, bractearum modo imbricatis, inter spinas assurgentibus: dorsalis parte spinosa postice unimaculata: cauda utrinque bimaculata: squamis magnis.*

D. 20 + 9; A. 5 + 8; P. 15; V. 1 + 5; C. $\frac{3 \text{ v. } 4}{3 \text{ v. } 4} + \text{III}$; M. B. 5.

Fam. FISTULARIDÆ.

CENTRISCUS GRACILIS. *C. corpore gracili, angusto, elliptico-oblongo, supra fusco, lateribus argenteis: rostro producto, elongato: pinnæ primæ dorsalis, inter oculos pinnamque caudalem mediae, spina secunda mediocri, breviore, pinnam caudalem nequaquam attingente.*

1^{ma} D. 4 v. 5; 2^{da} D. 11; A. 17; V. 1 + 4; P. 15; C. $\frac{7 + \text{IV}}{7 + \text{V}}$.

Rarior.

In its shape and colour this is very obviously different from the common red Snipefish (*C. Scolopax*, L.). But I have not been able to assure myself that the above differences are not sexual. They are not certainly dependent upon size. The depth averages from one-fifth to one-sixth and a half of the whole length, instead of one-fourth of the same. In two individuals of the same length within one quarter of an inch, the depth of the larger (*C. Scolopax*, L.) was very nearly double that of the smaller (*C. gracilis*, nob.) and the 2nd spine of the 1st dorsal fin was respectively in each one-fourth and one-seventh of the whole length of the fish.

Fam. ESOCIDÆ.

BELONE GRACILIS, nob.—“*Catuta*.”

Early in March last year (1838) a fisherman brought alive in sea-water two fishes, which, in their slenderness, and the upper jaw being only half the length of the lower, differed obviously from the common *B. vulgaris*. Measuring, however, seven or eight inches only in length, it seemed questionable, in the absence of equal-sized individuals of *B. vulgaris* for comparison, whether they might not be the young of that species. My friends, however, the Rev. L. Jenyns and Mr. Yarrell, have examined these two individuals, and the latter warrants me in stating, on their joint authority, that these two fishes

are "not, in their opinion, *B. vulgaris*," being "much more slender for the same or equal length."

Scomberesox Saurus, Cuv.

The Portuguese name "*Delphine*" (rectius "*Delfim*"), is erroneously appended to this fish. Another individual has been lately brought to me with the name of "*Almeirão*," but the species is far too rare to have obtained any permanent and genuine appellation in Madeira.

Fam. SALMONIDÆ.

SCOPELUS MADERENSIS.

A small dark mulberry-coloured fish, which might easily be taken for the fry or young of *Pomatomus telescopus*, Risso. The dark vinous-coloured ground is concealed by very large deciduous platina-like scales. The only individual which has yet occurred was three inches long. It approaches very near to *Sc. Humboldti*, Risso, Hist. iii. 467. (supposed to be identical with Pennant's *Argentine*, Yar. 11. 94.), and has the row of longer silver dots, or pits, extending forwards from the root of the caudal fin along the ventral line: but it disagrees remarkably with the generic characters assigned to *Scopelus* by Cuvier, R. An. 2nd Ed. ii. 314, in having both the palatines and tongue aculeate with teeth.

The fin-formula in the Madeiran fish was

1st, D. 3 + 10; 2nd, D. 1 club- or feather-shaped;

A. 2 + 12; P. 13; V. 1 + 7; C. $\frac{7+1+IX}{6+1+VIII}$.

Gen. ALYSIA.

Corpus subelongatum, compressum; dorso postice ventreque spinososerratis. *Rostrum* brevissimum, ore rictuque magnis, hoc pone oculos diducto. *Dentes* minuti, tenues; in maxilla inferiore, Vomere, et Palatinis scobinati. *Lingua* postice lateribus subaculeolata.

Squamæ magnæ, haud deciduae, scabré; squamis lineæ lateralis latissimis, maximis, scutellatis, s. per totam longitudinem loricatoimbricatis.

Pinnæ ventrales sub apice pinnarum pectoralium sitæ. *Dorsales* duæ; prima inter *Ventrales* et *Analem* posita; 2^{da} ad finem analis, rudimentali. *Pinna caudalis* minima, furcata.

ALYSIA LORICATA.

The spinoso-serrate ventral and hinder part of the dorsal lines, together with the peculiar scales of the lateral line, appear to forbid the blending of this interesting little fish with the Cuvierian genus *Aulopus*, as defined in the R. Anim., Ed. 2. ii. 315, though they have many characters in common. The Maderan fish is no less rare than elegant. It scarcely exceeds two inches in length. The back is a deep blue; the sides bright silvery or platina; and a row of dead-silver dots or pits extends along the ventral line, as in the *Scopelus* above described. The fin-formula is

1st, D. 2 + 10; 2nd, D. rudimentary; A. 2 + 21 (+ 8 detached depressed points or spines); P. 15 or 16; V. 1 + 5;
 C. $\frac{4 + I + IX}{3 + I + VIII}$.

Fam. GADIDÆ.

MACROURUS ATLANTICUS.—“*Praga*” or “*Lagartixa do mar.*”—

M. fusco-cinereus, dorso vinoso, gatturis umbilico pinnisque ventralibus atris: squamis areolato-scaberrimis, echinalatis, ecarinatis, inermibus: oculis maximis.

M. rupestris, nob. in Synops. Mad. Fish, p. 190, nec Bl. nec Cuy. et omiss. syn. *Lepidoleprus cælorhynchus*, Risso.

On further examination, this most singular fish appears to be quite distinct from *M. rupestris*, Bl. t. 177; and therefore, according to Cuvier (R. Anim. 2nd Ed. ii. 337, note,) from *Lepidoleprus cælorhynchus*, Risso, through which indeed alone I had referred it to the northern fish described by Bloch. But besides the points included in the specific character, the first ray of the first dorsal fin is neither serrate nor stronger than the rest. The diameter of the eye is one twelfth or one thirteenth part of the whole length, which scarcely exceeds one foot.

Fam. PLEURONECTIDÆ.

RHOMBUS CRISTATUS. *R. corpore oblongo-elliptico: oculis approximatis: dentibus tenuibus pectinatis; in maxilla superiore uniseriatis; in inferiore anguste scobinatis: pinnæ dorsalis dimidi anterioris radiis apice liberis; primordialibus (2^{do} 6^{m.}) productis, elongatis: latere (sinistro) fusco, immaculato: squamis (haud deciduis) magnis, margine scabris.*

D. 92; A. 75; V. 6; P. 1 + 9; C. $\frac{3 + VI}{3 + V}$. Rariss.

The Whiff of British authors (*R. megastoma*, Yarr. 2. 251) appears the nearest ally of this apparently new species. Indeed, except for Mr. Yarrell's more detailed account, I should have scarcely perhaps scrupled referring it to “La Cardine ou Calimande” of Cuvier's R. Anim. 2. 341, of which he says, “ses premiers rayons sont libres”; of course meaning of the dorsal fin. Nothing is, however, discernible of this in either Mr. Yarrell's figure or description of “The Whiff”; nor even, if correct, does it express sufficiently the peculiarity of this part in the Maderan fish. The only individual which has yet occurred was five and a quarter inches long.

Fam. CYCLOPTERIDÆ.

43. **LEPADOGASTER ZEBRINUS.**—“*Chupa sangue.*” *L. fusco-nigrescens, lateribus postice strigis obliquis, nuchaque fasciis divergentibus saturationibus maculisque binis cœruleis pyriformibus pictis: naribus biciliatis: pinnis dorsalibus analibusque caudali adnatis.*

D. 17 v. 16; A. 10 v. 9; P. 15 v. 16; V^s. 4; C $\frac{7}{4} + X$. Haud rara.

In the double nasal cilia, and connexion of the caudal with the dorsal and anal fins, this little fish agrees with *L. cornubicus* (Flem.), Yarr. 2. 264. The structure of the sucking disk is also similar to the representation of the same part in that species, and not to that of the "bimaculated Sucker," at p. 268. In this particular it perfectly agrees also with the former species indicated in my Synopsis, p. 190; which is, however, perfectly distinct specifically, having neither a nasal cilium nor the caudal fin united with the dorsal and anal fins. Of this last-mentioned species no second example has yet occurred. The present (*L. zebrinus*) is not by any means uncommon. It varies considerably in intensity of colour, and in the distinctness of the darker stripes upon the nape and flanks. The nasal ciliæ are of the general dark brown or blackish tint.

Fam. ECHENEIDÆ.

SS. Cauda lunata.

Echeneis Remora, L. Syst. Ed. 12.—"Pegador." *E. tota cinereo-fuliginosa*, nigrescens: laminis disci xvii. v. xviii.; pinnis pectoralibus brevibus, ovatis, integris, apice rotundatis: lingua lœvi.

D. 23; A. 23; P. 26; V. 1 + 5; C. $\frac{3 \text{ v. } 4 + \text{ VIII}}{3 \text{ v. } 4 + \text{ VII}}$; M. B. 9. Rarior.

ECHENEIS PALLIDA. *E. tota pallide cinerea*, fuligineo hinc et hinc subnebulata: laminis xix.; pinnis pectoralibus brevibus, latis, apice rotundatis, subtruncatis, tenuiter crenulatis: lingua medio scobinata.

D. 24; A. 22; P. 27; V. 1 + 5; C. $\frac{3 \text{ v. } 4 + \text{ VIII}}{3 \text{ v. } 4 + \text{ VII}}$; M. B. 9. Rariss.

SS. Cauda integra, S. truncata.

ECHENEIS JACOBÆA.—*E. tota cinereo-fuliginosa*, nigrescens: laminis xix.: pinnis pectoralibus brevibus, latis, pectinato-rotundatis crenatis: ventre sulcato: lingua scabra.

D. 24; A. 24; P. 21; V. 1 + 5; C. $\frac{3 + \text{ VII}}{3 + \text{ VIII}}$; M. B. 8. Rariss.

ECHENEIS VITTATA.—*E. purpureo-nigrescens*, pallido variegata, fascia nigra longitudinali laterali, antice utrinque albo marginata: pinnis pectoralibus ovatis, acutiusculis, integris; pinnæ dorsalis analisque antice caudalisque marginibus albis: laminis xxiv.: lingua scabra: oculis magnis: corpore elongato, postice valde attenuato, gracili.

D. 39; A. 39; P. 22; V. 1 + 5; C. $\frac{1 + \text{ VIII}}{1 + \text{ VII}}$. Rariss.

The nearest ally of this very distinct species appears to be *E. lunata*. Bancr. in Zool. Journ. V. 413. t. 18. But this, besides other differences, has a lunate tail.

ECHENEIS BRACHYPTERA. (Echeneis —? Syn. p. 191.) *E. cinereo-fuliginosa*, nigrescens; pinnis dorsalibus analibusque antice

albo submarginatis : laminis xvi. : pinnis pectoralibus brevibus, latis, truncatis, integris : lingua medio scobinatu.

D. 28; A. 24; P. 26; V. 1 + 5; C. $\frac{3 \text{ v. } 4 + \text{ VII}}{3 \text{ v. } 4 + \text{ VII}}$; M. B. 8

This is the first of the two species indicated by me in the former part of this List or Synopsis. Of the second sort, there mentioned as having been seen by Miss Young, and which I have there doubtfully referred to *E. naucrates*, L., no fresh example has occurred. I should now be much inclined to consider it identical with *E. vitata*; but Miss Young affirms that it was "certainly plain-coloured."

Fam. MURÆNIDÆ.

Sphagebranchus serpens.

S. serpa, Risso, Hist. Nat. iii. 195. No. 81.

A single individual only has occurred, precisely answering to the description above referred to. It measured eleven inches in length. I could not detect the slightest rudiment of pectoral fins.

Fam. GYMNODONTIDÆ.

TETRODON CAPISTRATUS. *T. pusillus, oblongiusculus levissimus ; dorso illiisque inermibus, nudis ; ventre adpresso-spinelloso : dorso fusco ; lateribus ochraceo-fulvis, fusco longitudinaliter bifasciatis, capiteque utrinque cœruleo punctatis, illiis oblique lituratis, rostroque subproducto gulave semi-capistrato : pinna caudali utrinque nigro-limbata.*

D. 9; A. 8; P. 16; C. $\frac{2}{2 \text{ v. } 3} + \text{ VIII.}$ Rariss.

A most elegantly-coloured little species, which I cannot refer with certainty to any already described. Only two individuals have hitherto occurred. The first was little more than two inches long: the second nearly twice as large.

The *Orthagoriscus* of Madeira, called by the fishermen, "Peixe Porco," or "Bouto," I forbear at present to designate further, not having seen a sufficient number of individuals to determine its characters. The caudal fin is produced into a short point in the middle, not truncate, as in all the figures to which I have access of the European Sun-fishes.

Fam. SQUALIDÆ.

CARCHARIUS FALCIPINNIS. "Faquetta." *C. corpore supra griseo-cinereo, subabbreviato, medio crassiore s. altiore, utrinque attenuato : rostro brevi, lato, depresso, apice obtuso : oculis rotundatis : pinna dorsali prima alta, triangulari, subantica s. supra medium pinnarum pectoralium posita : pinnis pectoralibus falcatis, angustis, elongatis, apice obtusis : pinna dorsali secunda analique oppositis : ventralibusque parvis.* Rariss.

An *Squalus ustus*, Dum.

It is perhaps only for want of better materials for comparison that I have been unable to refer this Shark precisely to the above-indicated or to some other described species. It is about three feet long,

and the female differs in nothing from the male. The teeth are precisely similar to those of the "Tintureira" (*C. glaucus*, Cuv.)

The "Marraxo" proves to be, as I suspected, *Lamna cornubica*, Cuv., adult, or of large size.

Gen. ACANTHIDIUM.

Corpus gracile, elongatum. *Spiracula magna*. *Pinnæ dorsales* dueæ, antice spiniferæ; secunda majore postica, caudæ approximata. *Pinna analis nulla*. *Pinnæ ventrals*, subposticæ s. secunda dorsalis subanteriores.

Dentes utriusque maxillæ dispares, parvi: superioris laniarii, planotriangulares, tenues, acuminati; acumine recto; basi utrinque denticulo aucto; antice triseriati, lateribus biseriati: inferioris incisorii, acumine utrinque a medio oblique deflexo, uni- vel bi-seriati. *Cauda* oblique oblonga, apice truncata.

This new genus appears exactly intermediate between the established genera of Cuvier, *Spinax* and *Centrina*: agreeing with the former in its elongated form, and with the latter in the teeth.

The ventral fins are placed more backward than in *Spinax*, but rather forwarder than in *Centrina*, i. e. neither halfway between the two dorsal fins, nor opposite the second dorsal fin, but just before the second dorsal fin, which begins exactly opposite the termination of their base. The tail or caudal fin resembles that of *Spinax*, rather than of *Centrina*, and the spines of both the dorsal fins are reflexed as in *Spinax*, forming the fore-edge of each fin. The pectoral fins are abruptly truncate. The second dorsal fin is greatly larger than the first; in which it differs equally from *Spinax* and *Centrina*. The teeth are not arranged quincuncially, but behind each other in rows.

Two species have occurred, both of which have hitherto been confounded with *Centrina*.

ACANTHIDIUM PUSILLUM. "Gata negra." *A. totum atrum*, *pusillum*: *rostro crassiusculo*: *dentibus inferioribus uniseriatis*: *spiraculis oculo remotiusculis*.

Centrina? nigra, nob. olim in Proceed. Zool. Soc. 1833, p. 144*. Syn. Mad. Fish in Trans. Zool. Soc. p. 194. Rariss.

Four individuals of this curious little shark have now occurred, agreeing equally in the foregoing characters and in their dimensions, varying in length only from eleven to twelve inches. The second dorsal fin is somewhat forwarder or more distant from the origin of the tail than in the next species.

The condition of the teeth, and constancy of size, both indicate an adult fish; and a comparison of the present species with the

* A serious erratum has been caused here by the transposition of a sentence. The paragraph referred to should stand thus: "It (*Centrina?* nigra) is intermediate in characters between *Centrina*, Cuv., and *Acanthias*, Risso, having the teeth of the former genus as well as the backward position of the second dorsal (*rectius ventral*) fin, and the form of body of the latter."

foetal and adult state of the following, in these two points alone demonstrates *Acanthidium pusillum* to be no stage of *A. culceus*.

ACANTHIDIUM CALCEUS. "Sapata." *A. purpureo-fuscum, subtus pallidius : rostro plano-depresso : dentibus inferioribus biseriatis : spiraculis oculo, pinnaque dorsali secunda caudæ approximatis.*

Centrina Salviani, Syn. Mad. Fish in Trans. Zool. Soc. p. 194 : nec aliorum. Rarior.

This shark very much resembles in its general aspect *Scymnus nicæensis*, Risso, the "Gata" of Madeira : but is at once distinguished by the spines in front of the two dorsal fins, which, as in *A. pusillum*, are both recurved, and ought, had I attended to the excellent figures copied by Willoughby from Salviana of *Centrina nigra*, Cuv., instead of allowing myself to be deceived by a miserable figure of Lacepède's, alone to have preserved me from the blunder of referring to that species for the present shark, the usual size of which exceeds by a few inches only three feet.

Fam. RAIIDÆ.

Raia oxyrhyncus, Will., Ichth. p. 71.—“Raia.”

Sharp-nosed Ray, Penn., Ed. 1. iii. 83. No. 31. Yarr., Brit. Fish. ii. 424.

Two male individuals only have occurred : the largest, measuring three feet in width from wing to wing, was furnished on the back with patches of strong hooked spines or prickles, much as in the figure in the British Fishes ; but the second example, scarcely two feet wide, although decidedly a male, was devoid of these appendages. The colour of the upper surface was a pale, dull, yellowish, or ashy-grey, obscurely mottled or dappled with a few scattered distant paler whitish spots.

TRYGON ALTAVELA.—“*Andorinha do mar.*” *T. corpore rhomboideo, duplo latiore quam longo, alis expansis, cauda perbrevi.*

Pastinaca marina altera πτερυπλατεῖα, Altavela Neapoli dicta *Colum næ.* Will., Hist. 65. Tab. C. 1. f. 3. (Copied from F. Columna.)—Rariss.

A single female individual only has occurred, measuring five feet and a half from tip to tip of wings.

June 11, 1839.

William Yarrell, Esq., Vice-President, in the Chair.

Mr. Bucknell exhibited his *Eccaleobion*, or machine for hatching eggs; and having broken eggs in every stage of incubation, explained the nature and incidents of the process. Mr. Bucknell stated that the period of incubation in the common fowl, which was, on an average, 21 days, sometimes varied from 18 to 24 days, and that he attributed this variation to the mode of keeping, and previous treatment, by which the embryo was injured, either from the heat of the weather, exposure to variety of temperature, jolting in carriage, &c. The young bird was occasionally known to emit a faint chirp even so long as 24 hours before being excluded; and he believed that if this noise was heard on the 18th day the chicken would probably appear on the 19th. From this and other circumstances, such as the common mode of preparing eggs by varnishing, &c., the porosity of the shell, and other similar causes, he concluded that the small globule of air constantly found in eggs, and which he had observed to increase according to the age of the egg, was produced by the air penetrating the substance of the shell and its lining membrane.

The average number of malformations, according to Mr. Bucknell's experience, was not more than five in a thousand; though in Egypt, it was stated, that malformations were extremely common in the artificial process of incubation. He attributed this circumstance to an excess of heat, and generally found it to affect the toes and extremities; sometimes also the muscles of the neck.

A general conversation afterwards took place on this subject, during which much interesting and valuable information was extracted, with regard to the period and circumstances of the incubation.

A letter from H. Cuming, Esq., Corr. Memb., dated Manilla, November 18, 1837, was read. This letter stated that Mr. Cuming had forwarded a collection containing 395 birds and 12 quadrupeds, from the southern part of the Island of Luzon.

Mr. Cuming states that quadrupeds are scarce in the Philippine Islands, and that he has been able to procure all the species known excepting three, two of which are Deer, and the third is a species of Buffalo, of small size, with straight and sharply-pointed horns. This last animal Mr. Ogilby stated was most probably the *Anoa depressicornis*.

Mr. Ogilby exhibited the skull of an Elk from Nova Scotia, brought over by Dr. Cox, and remarkable for its great size as compared with the dimensions of the horns.

No. LXXVIII.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

Mr. Ogilby also called the attention of the meeting to a collection of skins from Sierra Leone, exhibited by Mr. Garnett. Among others were three of the Chimpanzee, apparently adult, but too much mutilated to admit of obtaining the dimensions; two of *Colobus ur-sinus*, one of which had the tail of a rusty white colour, instead of the pure white which generally characterizes the species; and one of a species of Cat, which Mr. Ogilby believed to be undescribed, and for which he proposed the name of

FELIS SERVALINA. *F. suprà fulva, maculis nigris, minutis, copio-sissimis; subtùs albida; caudá brevissimā.*

"This species appears to be about the size of the common Serval, but differs from that animal in having a shorter tail, and in the very numerous and minute black spots which are scattered over the shoulders, back, and flanks. It is only on the thighs and arms that the spots become large and distinct; there they are less numerous, and resemble those of *Felis Serval*. The head and fore part of shoulders are entirely free from spots; the median line of the back is of a deeper fawn than the rest of the body, the minute spots having a particular tendency to run into lines; the belly is of a dirty white colour, with large brown blotches, and the tail does not exceed the length of the same organ in the lynxes. This character is alone sufficient to distinguish the present species from all the other African cats with which I am acquainted. The mutilated condition of the skin unfortunately prevents me from describing the characters of the ears, legs, feet, and under parts of the body."

	Ft. In.
Length of the skin from the muzzle to the root of the tail	} 2 10
Length of the tail	0 8

As regards the species of *Colobus*, Mr. Ogilby observed, that from information communicated by M. Temminck, he was now convinced that it was identical with the *Colobus polycomos* of Pennant.

Mr. P. Buckley Williams exhibited various specimens of White-Bait (*Clupea alba*, Yarrell,) from the Dovey and some other rivers of North Wales, and stated that the common belief, that this was confined to the Thames, was now proved to be erroneous, not only from the facts now stated, but likewise from their abundance in the river Forth of Scotland, as shown by Dr. Parnell.

June 25, 1839.

Dr. Bostock in the Chair.

Dr. Richardson read his account of an interesting collection of fish formed at Port Arthur in Van Diemen's Land, by T. J. Lempiere, Esq., Deputy Assistant Commissary General, by directions from His Excellency Sir John Franklin, K.C.B., Lieutenant Governor, and now deposited in the museum of the Royal Naval Hospital at Haslar. The collection contains about thirty species, and the paper, which embraces only a part, gives detailed descriptions and anatomical notices of these, several of them being also illustrated by very elaborate drawings, executed by Mr. Charles M. Curtis with his wonted fidelity. The following species are included in the present paper, the others being reserved for a future communication.

1. *SERRANUS RASOR.* *Ser. maxillis valdè squamosis, apicibus radiorum pectoralium fasciculatis, compressis, lanceolatis; pinnis omnibus præter ventrales squamosis; radiis aculeatis pinnae dorsi subæqualibus; fasciâ oculum cingenti cæruleâ per lineam lateralem productâ.*

Radius:—Br. 7—7; P. 13; V. 1, 5; D. 10, 21; A. 3, 9; C. 15 $\frac{1}{4}$.

The *Serranus Rasor*, or *Tasmanian barber*, is a beautiful fish belonging to that group of *Serrani* which was named *Anthias* by Bloch, none of which had previously been described as inhabitants of the Australian seas. It agrees with the barber-fish of the Caribbean seas in having no elongated dorsal rays, and may be distinguished readily from all the known *Serrani* by the peculiar form of its pectoral rays, whose numerous branchlets are so graduated and closely approximated as to give a flat lanceolate shape to the tip of each ray. The general colour of the fish is reddish brown, with umber-brown spots, a dark patch beneath the end of the pectorals, a bright blue stripe crossing the anterior suborbitar, encircling the eye, and running along the lateral line to the caudal fin. There are also thirteen or fourteen narrower blue streaks on the lower part of the flanks and tail. The fins are lake-red, and are all, except the ventrals, more or less scaly.

2. *CENTROPRISTIS SALAR.* *Cent. operculo suboperculoque squamosis; interoperculo seminudo; preoperculo subdenticulato; pinnis dorsi anique in fossis receptis.*

Radius:—Br. 7—7; P. 16; D. 9, 16; V. 1, 5; A. 3, 10; C. 17 $\frac{1}{3}$.

This species is known locally as the salmon, and differs from *C. truttaceus*, as described in the *Histoire des Poissons*, in the distri-

bution of the scales on the gill-covers, and in some other minute particulars. *Truttaceus* is said to have the interoperculum and suboperculum entirely naked, and only a few scales on the operculum itself ("quelques écailles sur sa surface"). In *C. salar* there are five rows of pretty large scales on the operculum, one row on the suboperculum, covering surfaces of both these bones, and a row of smaller scales on the interoperculum, clothing its upper half only. As these scales are very easily detached, and the gill-plates remain hard and silvery, after they are removed with the epidermis, it must be difficult to distinguish an injured specimen from *truttaceus*; whose description in other respects exactly accords with *salar*, except that the latter has the suborbital very faintly denticulated, and two rays fewer in the soft dorsal.

3. *APLODACTYLUS ARCTIDENS*. *Apol. dentibus oris tricuspidatis, superioribus in serie octuplici, inferioribus in serie quintuplici dispositis; cæcis pylori quatuor.*

Radii :—Br. 6—6; P. 9 et 6; V. 1, 5; D. 16—1, 17; A. 3, 8; C. 16 $\frac{1}{2}$.

This species differs from *A. punctatus* of the Chilian seas (the only species previously known) in its dentition, but resembles it so much in external form, colours, and markings, as well as in anatomical structure, that it cannot be placed in a separate genus. In the *Histoire des Poissons* the teeth of *dentatus* are described as follows: "Les dents sont disposées sur trois rangées à la mâchoire supérieure et sur deux à l'inférieure : elles sont aplatie et ont leur bords arrondis et dentelés en petits festons ; elles sont très-semblables à celles des *crenidens*, on en compte quatorze de chaque côté à la mâchoire supérieure et treize à l'inférieure. Derrière ces rangées antérieures il y a des petites dents grenues sur une bande étroite à chaque mâchoire." In the Van Diemen's Land fish, the teeth stand in eight or nine crowded ranks in the upper jaw, and in five or six in the lower one, those of the interior rows being very much smaller in all their dimensions, but otherwise shaped exactly like the teeth of the exterior rows, which resemble those of *punctatus*. Their points show three small lobes, the middle lobe being largest and most prominent. The species further differs from *punctatus* in having four caeca, but its food appears to be similar, the intestines having been found filled with large fragments of sea weed, apparently *Ulva umbilicalis*.

4 and 5. Two new species of gurnard were then mentioned as the first of the genus that have been brought from the Australian coasts, though one species (*Trigla kumu*) is known to inhabit the seas of New Zealand. They were stated to agree with that species, with several Indian ones, and with *Trigla paciloptera* of the Mediterranean, in their large pectoral fins being ornamented with eye-like marks similar to those on the wings of some lepidopterous insects. One of them, *TRIGLA POLYOMMATA*, has minute cycloid scales on the body, an unarmed lateral line and the dorsal plates confined to the first dorsal, there being no dilation whatever of the interspinous bones of the second dorsal. All the spines of the head are stiletto-

shaped, and one whose base occupies the whole anterior end of the infraorbital on each side, projects boldly beyond the snout, and gives the fish a very different aspect from any other known gurnard.

The other may be thus characterized:—

5. **TRIGLA VANESSA.** *Tri. squamis aspersis mediocribus; linea laterali aculeatâ; fossâ dorsali ad finem usque pinnæ posterioris armatâ, orbitâ oculi edentatâ, pinnâ pectorali amplâ labeculis aculeis binis ornatâ, maculâ inter aculeum pinnæ dorsi quintum et octavum nigrâ.*

Radii :—Br. 7—7; P. 12—III.; V. 1, 5; D. 8, 12; A. 12; C. 13 $\frac{1}{2}$.

Trigla Vanessa has a spinous infraorbital tooth, larger than usual in gurnards, though not so remarkable as in the preceding species, and not occupying the whole end of the bone, there being a smaller tooth and some granulations beneath it. The arming of the dorsal furrow extends to both fins, and is formed by saddle-shaped dilatations of the interspinous bones, with a triangular spinous tooth on each side of each plate directed backwards. The scales of the body are rather large, and are studded on their uncovered portions with minute spiny points; those forming the lateral line are tubular both transversely and longitudinally, and are armed with several strong spines also tubular. There is a black mark on the anterior dorsal. The sides of the head are finely granulated without radiations, and there are no denticulations on the edge of the orbit either in this or the preceding species.

6. *Apistes marmoratus* (Cuv. et Val. 4, p. 416). The specimens correspond exactly with the description given in the work referred to, except that the first suborbital has only one tooth anteriorly. The spine of that bone reaches in one specimen to the preoperculum, but in another it is one third shorter, being in the latter case only just equal to the preopercular spine in length.

7. *Sebastes maculatus* (Cuv. et Val.). Two specimens in good order, when examined in reference to the account of the species in the work referred to, offer no discrepancy, except that the postorbital spines are somewhat different from those of *imperialis*, which *maculatus* is said closely to resemble. *S. maculatus* is an inhabitant of the seas of the Cape of Good Hope, and although a range from thence to Van Diemen's Land may appear very great, it is not more extensive than that of the northern *sebastes* which has been taken on the coasts of Greenland, in the gulf of St. Lawrence, on the coast of Norway, and in the British Channel.

8. *Cheilodactylus carponemus* (Cuv. et Val.), known locally as the Perch, and described as having, when fresh, a bright silvery hue with dark spots.

9. **NEMADACTYLUS CONCINNUS.** The fish so designated is stated by the author to be one of those species whose natural position is difficult to ascertain, from their partaking of the characters of several different groups. Viewed as the type of a new genus, *Nemadactylus* may be characterised as having none of the bones of the gill-cover armed or sculptured, the operculum itself being destitute

of projecting points, but as differing from any described sparoid form in having simple inferior pectoral rays, one of them projecting beyond the rest, as in *Cheilodactylus*, and in the teeth, which are minute and slender, in a single row on the jaws. The palate, vomer, tongue, and pharyngeal parietes are toothless. The fins are scaleless, the dorsal single, the branchial rays only three in number, the scales cycloid, and the pyloric cæca few (three). There is but one specimen of *Nemadactylus concinnus* in the collection, which is three inches and a half long, has a compressed elliptical form, and a sparoid aspect. Its lateral line is marked by a series of bright thin scales, and beneath it, the integuments are merely silvery with wrinkles, as in some scomberoid fishes; but the specimen has been long in spirits with other fish, and it is possible that the scales of the flanks may have been detached. If they actually existed, they must have been proportionably larger than those on the back, judging from the wrinkles of the epidermis. The scales of the back and top of the head are small, thin, and delicate, like those of a mackerel.

Vertebræ 34.

It may be thus characterized:—

NEMADACTYLUS, n. g.

Piscis acanthopterygius. Operculum lœve, inerme. Pinnæ esquamosæ, pinnâ dorsalis unicâ: radii pinnæ pectoralis inferiores (sex) simplices, quorum unus productus. Costæ branchiostegæ paucæ (tres). Intermaxillarum pediculi breves. Dentes gracillimi minimi in ambitu oris tantum positi. Fauces palatum et lingua glabri. Squamæ teneræ, lœves, infraque lineam lateralem scomberoideæ. Cæca pylorica pauca (tria).

N. concinnus, species unica adhuc cognita.

Radii:—Br. 3—3; P. 9 et 6; V. 1, 5; D. 17, 28; A. 3, 15; C. 15 $\frac{1}{2}$.

LATRIS HECATEIA is the appellation given by the author to the type of another annexant genus, which he considers as taking its position most naturally among the *mænoideæ*, but as having many characters in common with a percoid group composed of the genera *therapon*, *datnia*, *pelates*, *helotes*, and *nandus*. In *Latris* the mouth is moderately protractile, the dentition is similar to that of *mæna vomerina*, there is a scaly groove for the reception of the deeply notched dorsal as in *gerres*, which genus it further resembles in its opercular bones, the preoperculum being very finely denticulated, and the operculum terminated by a slightly concave line without projecting angles. The ventrals are still further back than in *Cæsio*, and the cæca are few in number. The scales are cycloid, without teeth or cilia, and the genus unlike any previously described mænoïd group has the lower pectoral rays simple like those of *aplodactylus*. There are no elongated scales at the base of the ventrals. *Latris Hecateia* is marked by three well-defined dark stripes on each side of the back, with a more diffused one inferiorly on the flanks, the four pyloric cæca are short and wide, and the only specimen in

the collection is eleven inches long, which is said to be the ordinary size.

The principal characters of this genus are as follows:—

LATRIS, n. g.

Piscis acanthopterygius, mænoideus. *Pinnæ esquamosæ*: dorsi pinnâ unicâ, profunde emarginatâ, in fossâ decumbens: ventrales pinnæ sub abdomine medio positæ. Radii pinnæ pectoralis inferiores (novem) simplices. *Preoperculum* denticulatum. *Os modicè protendens*. *Dentes* in oris ambitu tignoque vomeris positi villosi, in ossiculis pharyngeis parvi, subulati, conferti. *Palatum linguaque læves*. *Squamæ læves*.

L. Hecateia, species unica detecta.

Radii :—Br. 6—6; P. 9 et 9; V. 1, 5; D. 18, 36; A. 3, 27.

11. THYRSITES ALTIVELIS. *Thyr. radiis pinnæ dorsi aculeatis, corpus altitudine æquantibus; dentibus intermaxillæ utriusque quatuordecim, in latere maxillæ inferioris utroque duodecim.*

Radii :—Br. 7—7; P. 14; V. 1, 6; D. 20—1, 11 et VII; A. 1, 10 & VII.; C. 17 $\frac{1}{2}$.

A single specimen of this fish in the collection, agrees in most particulars with the description of *Thyrsites atten* in the *Histoire des Poissons*, but the spinous rays of the dorsal fin are considerably higher in proportion, and the teeth on the jaws much fewer.

12. BLENNIUS TASMANIUS is an undescribed species strongly resembling some of the European ones.

13. CLINUS DESPICILLATUS differs from *C. perspicillatus* of the *Histoire des Poissons* in possessing a thicker form, a larger head, a proportionably smaller eye, and in wanting the nuchal marks which give the name to that species. The marks on the body are arranged as in *perspicillatus*, but there are three transverse bands on the pectoral and caudal fins, with many other spots not mentioned in the description of the latter. The dorsal rays are 36, 4, and in other particulars the two fish seem to be much alike.

14. LABRUS LATICLAVIUS. *Lab. smaragdinus, fasciis binis lateribus puniceis purpureo marginatis, posticè in unum coalescentibus, inque pinnâ productis; pinnâ dorsi basi viridâ, in medio latè purpureâ: supernè aurantiacâ, purpureo guttatâ, inque margine extremo cæruleâ; pinnâ ani basi aurantiacâ, dein primulaceo-flavâ, utrinque cæruleo cinctâ, exinde purpureâ cæruleo guttatâ, denique in extremo margine cæruleâ.*

Radii :—P. 12; V. 1, 5; D. 9, 11; A. 3, 10; C. 14.

This is a very handsome species, having a duck-green colour, with two lake-red stripes, commencing at the gill-opening and uniting opposite the end of the dorsal to form a single broader stripe which is continued into the caudal fin. These stripes are bordered on both sides by dotted lines of plum-blue, and there are also five rows of blue spots on the sides of the belly, and three rows near the base of the

anal fin, on a lake-red ground. Several purple lines radiate from all sides of the orbit, and some pass over the preoperculum, interoperculum, and lower jaw. The dorsal is dark-purple, with green at the base of the rays, and an orange band at the tips, spotted and finally edged with blue. The anal has an orange streak along its base, then a broad primrose-yellow band edged above and below by a narrow blue line, next a broad band of purple with many very regular blue spots, and finally a narrow blue edging. The caudal is purple, with many plum-blue spots near its extremity in a vertical band. The other fins are apparently colourless. The aspect of the fish is that of a *Julis*, but the operculum and cheeks are scaly.

15. *LEPIDOLEPRUS AUSTRALIS*. *Lep. squamis corporis ordinibus plurimis aculeorum arctè incumbentium instructis; pinnâ ani plus dupli altitudine pinnam dorsi posteriorem superante.*

Radius :—Br. 6—6; P. 16; V. 1, 6; D. 2, 11—89; C. 1.

This is an example of a genus which had not previously been detected in the southern hemisphere. It has the general form of *Lepidoleprus caelorhynchus*, but there are abundant specific differences, especially in the relative size of the fins, and in the arming of the scales, which in the Antarctic fish consists of rows of closely-incumbent strong spines. The author has compared it with examples of *caelorhynchus* from the Mediterranean, and also from Madeira, both in the Society's museum, whose scales are totally different. None of these examples have the first dorsal ray serrated, as it is stated to be by writers who have described and figured the Greenland and Iceland *Macrourus rupestris*, yet Cuvier states that he has ascertained the identity of the latter with the Mediterranean fish. The first dorsal ray of *L. australis* is also smooth. There are sixty-seven vertebrae, of which fourteen are abdominal. The collection contained three specimens.

A *platycephalus* intermediate between *fuscus* and *grandispinis*, a *scorpaena*, a *cheironectes* which is figured in Ross's Annual for 1835, a *dajaus* closely resembling its American prototypes, several handsome *Balistes* and *monacanthi*, a *diodon* and several *tetrodontes*, a new form of *torpedo*, some fresh-water fishes, and several other sea ones, are reserved for a future communication.

A paper by T. C. Eyton, Esq., entitled "Catalogue of a Collection of Birds from Malaya, with descriptions of the new species," was read.

"The collection of Birds, of which the following is a catalogue, are in the possession of Mr. Evans of the Wyle Lop, Shrewsbury, having been collected by his brother in the above-mentioned country. This collection is particularly interesting when taken in conjunction with that of the neighbouring islands of Sumatra and Java, an account of which is published in the Transactions of the Linnean Society, vol. xiii., by Sir T. Stamford Raffles and Dr. Horsfield.

"The zoology of Malaya is altogether highly deserving of the at-

tention of the naturalist, presenting as it does a connecting link between those families of which Australia is the metropolis, and the forms of the Old World. The ornithology of Australia is distinguished by the number of species belonging to the family *Meliphagidae* which it produces, and we find from the present catalogue and that above-mentioned, that the Indian islands and the Malay peninsula also possess a greater number of species belonging to this family than any other portion of the world excepting Australia. This transition may also be traced through the marsupial animals, and man, the Malay variety of the human species approaching nearer to the Australian than any other in the form of the cranium.

"The present collection contains eighty-nine species, of which several are new to science; there are also some entirely new genera: it is singularly deficient in Raptorial and Natatorial birds, not possessing one of either order; but this perhaps may be owing to the collection having been made chiefly in the interior."

Podargus Javanicus, Horsf. Native name, *Burong Saiang*.

Harpactes Duvaucelii, Gould. Native name, *Burong Mass*.

Harpactes Diardii, Gould. Native name the same as the preceding.

Eurystomus cyanocollis, Vieill. Native name, *Tihong Lampay*.

The collection contains both male and female; the latter is merely distinguished from the former by its more obscure colouring.

Eurylaimus Corydon, Temm.

Cymbyrhynchus cucullatus. *Eurylaimus cucullatus*, Temm.

Native name, *Tamplana Lilin*.

Cymbyrhynchus nasutus, Vig. Native name, *Burong Ujuu*.

Halcyon Capensis, Sw. Native name, *Burong Kaha*.

HALCYON VARIA. *H. pectore, guld, ventre, strigaque oculos cingente ferrugineis; capite, nuchâ, et strigâ a mandibula inferiore ad capistrum brunneis, singulis pennis tæniis cæruleis ornatis: primariis, dorso, scapularibusque, brunneis, his externè flavo marginatis, illis maculatis; rostro flavo, culmine obscuro.*

Long. tot. $8\frac{1}{4}$ unc.; rostri, $1\frac{1}{4}$ unc.; tarsi, $1\frac{1}{10}$.

Native name, *Kaing Kaing*.

Halcyon pulchella. *Dacelo pulchella*, Horsf.

Native name, *Kaing Kaing Kimba*.

Alcedo Smyrnensis, Lath. See *Kaing Kaing*.

Alcedo cærulea, Linn. Native name, *Raja Ulang*.

Nyctiornis amictus, Sw. *Merops amictus*, Temm.

Native name, *Kay Chua*.

Merops Javanicus, Horsf. Native name, *Berray Berray*.

Cinnyris Javanicus, Steph. Native name, *Clichap*.

Cinnyris affinis, Horsf. Native name, *Major*.

Calyptomena viridis, Raff. Native name, *Siebo*.

Chloropsis Malabaricus, Jard. and Selby. Native name, *Burong daou*.

The female differs from the male in having the markings less distinct.

Chloropsis Sonneratii, Jard. and Selby. Native name, *Mirbaduon*.

The female and young are destitute of the black throat, a straw-coloured mark being sometimes substituted for it.

Irena puella, Horsf. Native name, *Krouing*.

Muscipeta paradisea, Le Vaill. Native name, *Mira jabone*.

MUSCIPETA ATROCAUDATA. *Mus. toto corpore purpureo-atro, sed pectore imo abdomineque albis.*

Long. tot. 9 unc. : *rostri*, $\frac{1}{2}$ unc. ; *tarsi*, $\frac{7}{12}$ unc.

Native name, *Murra jabone*.

Genus MICROTARSUS, n. g.

Rostrum ferè capiti æquale, altius quàm latum, ad apicem incisum, ultraque nares compressum, ad basim setis armatum; *nares* membranaceæ, parvæ, rotundatae.

Tarsi brevissimi, superiore parte plumati; *digiti* debiles, externi vix longiores quàm interni; posteriores medios æquantes; *ungues* compressi, posteriores longissimi; *scuta* tarsi indivisa.

Alæ mediocres rotundatae, primâ pennarum spuriâ, secundâ breviore tertiatâ, tertiatâ duabusque proximis inter se æqualibus.

Cauda rotundata tectricibus superioribus mollibus et longis.

Obs. The above genus is closely allied to *Micropus* of Swainson.

MICROTARSUS MELANOLEUCOS. *Micr. ater, tectricibus primariis apicibus albis; rostro pedibusque atris.*

Long. tot. $6\frac{1}{4}$ unc. ; *rostri*, $\frac{1}{2}$ unc. ; *tarsi*, $6\frac{1}{2}$ unc.

Native name, *Mirba tando*.

Genus MALACOPTERON, n. g.

Rostrum ferè capiti æquale, altius quàm latum, ad apicem incisum, ultraque nares compressum, ad basim setis armatum; mandibulâ inferiore ad basim tumidâ.

Tarsi mediocres; *digiti* externi vix longiores quàm interni, posteriores medios æquantes; *ungues* compressi posteriores longissimi; *scuta* tarsi vix divisa.

Alæ breves, rotundatae; pennis secondariis primarias ferè æquantibus; primâ pennarum spuriâ, secundâ breviore tertiatâ, quæ longissima est.

Cauda paucarum pennarum composita, rotundata; tectricibus superioribus mollibus et longis.

Obs. This genus is allied to *Microtarsus* in some particulars and to *Brachipus* in others: it agrees with both in the soft and downy nature of the tail coverts.

MALACOPTERON MAGNUM. *Mal. fronte caudique ferrugineis, nucha atrâ, dorso strigâque transversâ pectore, cinereis, alis brunneis, rostro flavo.*

Long. tot., 6 unc.; *rostri*, $\frac{7}{2}$ unc.; *tarsi*, $\frac{9}{2}$ unc.

Fem. mare minor, capite nuchâque ferrugineo et atro maculatis.

Native name, *Burong Map*.

MALACOPTERON CINEREUS. *Mal. feminæ speciei præcedentis similis sed magnitudine multùm inferior.*

Long. tot. $5\frac{1}{2}$ unc.; *rostri*, 5 lin.; *tarsi*, 8 lin.

Brachypus entylotus, Jard. and Selb. Native name, *Merfa*.

BRACHYPTERYX NIGROCAPITATA. *Bra. vertice atro, genis cinereis, gula alba, dorso caudâque brunneis, pectore abdomineque ferrugineis hòc obscurissimo; rostri mandibulâ superiore fuliginosâ, inferiore flava, tarsis pedibusque brunneis.*

Long. tot. $6\frac{1}{2}$ unc.; *rostri*, $\frac{1}{2}$ unc.; *tarsi*, $1\frac{1}{2}$ unc.

Dicrurus Malabaricus, Steph. Native name, *Chanwee*.

Obs. *Dic. aeratus* of Stephens is the female of this species.

Lanius virgatus, Temm. Native name, *Burong Tana*.

LANIUS STRIGATUS. *Lan. dorso, caudâ alisque ferrugineis, illo atro strigato; paucis pennis tertiarum et flexurae alarum lined atris; capite cinereo, sparso et strigato atro; corpore subtùs obscurè albo; lateribus pectoreque parcè atro strigatis; rostro apice atro, basi alba; tarsis pedibusque brunneis.*

Long. tot. $6\frac{1}{2}$ unc.; *rostri*, $\frac{7}{2}$ unc.; *tarsi*, $\frac{9}{2}$ unc.

Obs. This is probably a young bird.

Lamprotornis chalybeus. *Turdus chalybeus*, Horsf.

Native name, *Terling*.

Turdus Mindanensis, Gmel. Native name, *Murray*.

Kittacincla macrourus, Gould. *Turdus macrourus*, Gmel.

Native name, *Mura buta*.

TURDUS MODESTUS. *Tur. dorso, tetricibus alarum, verticeque oliveo-brunneis; paucis tetricum primarium præpilatis albo; primariis caudâque brunneis; gula, strigâ oculari abdomineque albis, illâ maculis cinereis sparsâ; lateribus capitâ, et pectore inferiore cinereis; lateribus pectoreque superiore ferrugineis; mandibulâ superiore pedibusque brunneis, inferiore flava.*

Long. tot. $8\frac{3}{4}$ unc.; *rostri*, $\frac{7}{2}$ unc.; *tarsi*, $1\frac{2}{2}$ unc.

Native name, *Kwaran*.

PASTOR MALAYENSIS. *P. dorso, caudâ alisque viridi-aeneis; tetricibus tertiaris abdomineque albis; vertice nuchaque pennis elongatis, cinereis; paucis pennis viridi circumclusis; mento albo; corpore subtùs cinereo.*

Long. tot. $6\frac{3}{4}$ unc.; *rostri*, $\frac{1}{2}$ unc.; *tarsi*, 1 unc.

Fem. dorso brunneo; reliquis coloribus obscuris.

Native name, *Brass Brass*.

Lora scapularis, Horsf. Native name, *Durong Capas*.

Genus CRATAIONYX, n. g.

Rostrum forte; *mandibula superiore* arcuatâ, mediocri; *nares* rotundatae, basales, setis brevibus tectæ.

Pedes validi syndactyli; *digitis* medio posteriori inter se æquantibus, exterioribus interioribus vix longioribus.

Tarsi validi elongati; *ungues* validi, posteriores maximi.

Alæ remigibus primariis spuriis, secundis vix brevioribus tertiiis; 4^{is}, 5^{is}, 6^{isque} inter se æqualibus.

Cauda longa rotundata.

CRATAIONYX FLAVA. *Crat. ater vertice cristato; abdomine pectorque inferiore flavis; tarsis pedibusque flavis.*

Long. tot. 7 unc.; *rostri*, $\frac{1}{2}$ unc.; *tarsi*, $\frac{1}{2}$ unc.

Native name, *Seray Seray*.

CRATAIONYX ATER. *Crat. ænea, vertice cristato; abdomine pectorque inferiore, flavis; tarsis pedibusque flavis.*

Long. tot. 7 unc.; *rostri*, $\frac{1}{2}$ unc.; *tarsi*, $\frac{1}{2}$ unc.

Oriolus xanthonotus, Horsf. Native name, *Simpelong Rait*.

Oriolus Sinensis, Linn. Native name, *Kapindary*.

Gracula religiosa, Auct. Native name, *Tchong*.

Platylophus galericulatus, Temm. Native name, *see Jerray*.

Pitta brachyura, Auct. Native name, *Mortua Plando*.

PITTA COCCINEA. *P. occipite, nuchâ, corporeque subtûs coccineis; alis, dorso, caudâ, strigâ utrinque nucha, cyaneis; gutture ferrugineis; lateribus capitis, pedibus, rostroque atris.*

Long. corp. 8 unc.; *rostrum*, $\frac{3}{4}$ unc.; *tarsi*, $1\frac{1}{2}$ unc.

Native name, same as the last.

BUCROS BICOLOR. *Buc. ater, rectricibus tertiiis lateralibus caudæque apicibus albis; rostro albo, strigâ cingente basim atrâ; casside mediocri carinatâ à dimidio capitis ad bis tridentis rostri tendente.*

Long. corp. $33\frac{1}{2}$ unc.; *rostri*, 6 unc.; carina cassidis, 5 unc.; *tarsi*, $2\frac{1}{2}$ unc.

Jun. casside non perfectâ et atrâ.

Native name, *Kay Kay*.

Euplectes Philippensis. *Loxia Philippinensis*, Linn.

Native name, *Tampua*.

ANTHUS MALAYENSIS. *An. dorso brunneo, marginibus pennarum saturationibus; corpore subtûs ferrugineo leviter tincto; duabus rectricibus exterioribus caudæ albis; pectore maculis brunneis adperso; primoribus marginibus exterioribus flavis.*

Long. tot. $6\frac{3}{4}$ unc.; *rostri*, $\frac{1}{2}$ unc.; *tarsi*, $1\frac{1}{8}$ unc.; *ung. post.* $\frac{1}{2}$ unc.

Native name, *Lanchar*.

The present species, which is the *An. pratensis* of Raffles, and of which the collection possesses two specimens, is nearly allied to *Anthus trivialis*, but differs in being of a larger size.

Dicæum cantillans, Ste.

Dicæum saccharina. *Certhia saccharina*, Lath.

Native name, *Nella*.

Dicæum cruentata, Horsf.

DICÆUM IGNICAPILLA. *Dic. dorso, caudâ, tectricibus alarum, primariis externis partibus, lateribusque capitis obscurè azureis; strigâ oculari atrâ; gulâ corporeque subtûs aurantiacis; maculâ pectorali verticeque rubris.*

Long. tot. $3\frac{1}{2}$ unc. ; rostri, $\frac{7}{8}$ unc. ; tarsi, $\frac{1}{2}$ unc.

Native name, *Nalloo*.

Fem. supernè cinerea subtûsque flava irregulariter cinereo-maculata; rubro cristata.

ANTHREPTES FLAVIGASTER. *An. capite, dorso, pectore colloque cinereo-viridibus; corpore subtûs flavo; alis, caudâ tectricibusque alarum brunneis; rostri mandibulâ superiore atrâ, inferiore flavâ; pedibus brunneis.*

Long. tot. 8 unc. ; rostri, $1\frac{5}{8}$ unc. ; tarsi, $+\frac{1}{2}$ unc.

Native name, *Chichap Rimba*.

ANTHREPTES MODESTA. *An. vertice, dorso, alis, caudâque viridi-olivaceis hâc singulis pennis mediis brunneis, illâ præpilatâ atro; corpore subtûs viridi, singulis pennis in mediis obscuris; rostro pedibusque brunneis.*

Long. tot. $6\frac{1}{2}$ unc. ; rostri, $1\frac{1}{4}$ unc. ; tarsi, $\frac{5}{8}$ unc.

Native name, *Chichap Nio*.

Phænicophagus tricolor, Steph. Native name, *Kado besar*.

Phænicophagus chlorocephalus. *Cuculus chlorocephalus*, Raffles.

Native name, see *Lahia*.

Phænicophagus Crawfurdi, Gray. Native name, *Kada Kuchie*.

Phænicophagus Javanicus, Horsf. Native name, *Kada Apie*.

PHÆNICOPHAUS VIRIDIROSTRIS. *Phœn. alis dorso caudâque castaneis; primariis apicibus brunneis; rectricibus caudæ apicibus albis, ponè strigâ atrâ ornatis; capite, collo, pectoreque superiore cinereis, corpore subtûs ferrugineo.*

Long. tot. 13 unc. ; rostri, 1 unc. ; tarsi, 1 unc.

Native name, see *Lahia*.

Psittacula Malaccensis, Kuhl. Native name, *Tana*.

Bucco trimaculata, Gray. Native name, *Tanda*.

Bucco versicolor, Raff. Native name, *Tahoor*.

BUCCO QUADRICOLOR. *Buc. viridis; primariis brunneis; rectricibus caudæ inferioribus partibus azureis; fronte aureo, ma-*

culâ coccineâ posteriore utrinque ad latus locatâ ; strigâ peroculari atrâ, hâc anticè maculâ coccineâ, infrâ azureâ ornatâ ; gulâ coccineâ ; pectore superiore cœruleo maculis coccineis ornato ; maculâ flavâ ad angulum inferius rostri ; rostro, tarsis, pedibusque atris.

Long. tot. $8\frac{1}{2}$ unc. ; rostri, $1\frac{1}{2}$ unc. ; tarsi, $1\frac{1}{8}$ unc.

Native name, *Tahoor Capata Cuning*.

Genus **MEGALORHYNCHUS.** n. g.

Rostrum validum culminatum, carinâ basali vix ad apicem aduncâ ; altius quâm latum ; nares magnæ, basales, rotundatae ; setis tectæ.

Pedes scansorii ; digitæ bini locati ; exteriores singulis partibus æquales et longiores quâm interiores ; posteriores et exteriores brevissimi.

Alæ primis pennarum spuriis, secundis brevibus, tertiis, 4^{ties}, 5^{ties}, 6^{ties}, inter se æqualibus.

Tarsi mediocres.

Cauda rotundata, mediocris.

MEGALORHYNCHUS SPINOSUS. *Meg. superioribus partibus brunneis ; pennis præpilatis oleæ colore, vertice pennis mediis spinosis, oculis spatiis nudis et rubris circumdati ; gulâ obscurè ferruginea ; corpore subtus sordidè albo.*

Long. tot. $6\frac{1}{2}$ unc. ; rostri, $1\frac{1}{2}$; tarsi, $\frac{3}{2}$ unc.

Native name, *Ariko Berine*.

Chrysonotus Tiga. Picus Tiga, Horsf.

Native name, *Glato*.

Chrysonotus miniatus. Picus miniatus, Gmel.

Native name, *Glato*.

Picus validus, Temm. Native name, *Glato*.

Hemicircus badius, *Picus badius*, Raff.

HEMICIRCUS BRUNNEUS. *Hem. brunneus transversim ferrugineo strigatus ; gulâ strigis minutis : vertice genisque brunneis et non strigatis ; maculâ oblongâ ad latera cervicis flavo-ferruginea ; notâ ab angulo inferiore rostri utrinque ad gulam tendente coccineâ.*

Long. tot. $7\frac{3}{4}$ unc. ; rostri, 1 unc. ; tarsi, $\frac{3}{4}$ unc.

Hemicircus tristis. Picus tristis, Horsf.

Picus poicilophorus, Temm. Native name, *Glato*.

Polyplectron Chinquis, Temm.

Nycthemerus erythrophthalmus. Phasianus erythrophthalmus, Raffles.

Native name, *Pagas*.

Cryptonyx coronatus, Temm. Native name, *Bestum*.

PERDIX ÆRUGINOSUS. *Perd. æruginosus ; tertiaris transversim*

strigatis atro; abdomine gulâque saturatioribus; nullo calcare;
rostro tarsisque atris, illo fortis.

Long. tot. 10 unc. ; rostri, $\frac{5}{8}$ unc. ; tarsi, $1\frac{3}{4}$ unc.
 Native name, see Hole.

Hemipodius Taigour, Sykes. Native name, *Pochio*.

HEMPODIUS ATROGULARIS. *Hem. gulâ pectoreque superiore atris; pennis ad latera colli albis atro præpilatis; illis verticis et frontis atris, albo præpilatis; dorso brunneo, singulis pennis transversim strigatis atro, et maculis parvis albis sparsis; tectricibus atro præpilatis, et transversim latè strigatis flavo-ferrugineo; tectricibus caudæ ferrugineis, et super caudam tendentibus; lateribus atris; rostro aurantiaco pedibus, tarsisque brunneis.*

Long. tot. $6\frac{1}{2}$ unc. ; rostri, 7 lin. ; tarsi, 1 unc.
 Native name, *Pochio*.

Coturnix Sinensis, Temm. Native name, *Pechan*.

Columba Javanica, Gmel. Native name, *Paonay Crochi*.

Columba jambu, Gmel. Native name, *Paonay Gadang*.

Vinago vernans. *Columba vernans*, Linn.

Native name, *Paonay Crochi*.

Vinago Olax. *Columba Olax*, Temm.

Native name, *Semboan*.

Rallus gularis, Horsf. Native name, *Rentar*.

Gallinula phænicura, Lath. Native name, *Roa Roa*.

Porphyrio Indicus, Horsf. Native name, *Burong Tedone*.

Charadrius Virginianus, Bostik. Native name, *Kangbang Saut*.

Totanus Damacensis, Horsf. Native name, *Kadidie*.

Scolopax heterura, Hodgs. Native name, *Reshail*.

Mr. Waterhouse read a paper on a new species of Rodent which had been sent from the island of Luzon, one of the Philippines, by Hugh Cuming, Esq., Corresponding Member.

In general appearance this Rodent might be mistaken for a species of *Capromys*; in size it is about equal to the *C. Fournieri*; the general characters of the skull and dentition, however, indicate that its affinity is with the *Muridae*.

" The skull, compared with that of the common Rat, differs in being of a more ovate form, the occipital portion being somewhat elongated, and considerably contracted; the width between the orbits is comparatively great; and behind the orbits the frontal bones are expanded, and join with the temporal to form a distinct post-orbital process. The interparietal bone, instead of being transverse, is almost circular. The auditory bullæ are very small. The inter-dental portion of the palate is slightly contracted in front, so that the molares diverge posteriorly; the rami of the lower jaw are less

deeply emarginated behind, the coronoid portion is smaller, and the descending ramus is broader and rounded; the symphysis menti is of considerable extent. The incisor teeth are less compressed and less deep from front to back. The molar teeth are of a more simple structure; the anterior molar of the upper jaw consists of three transverse lobes, and the second and third consist each of two transverse lobes. In the lower jaw the anterior molar consists of four lobes, a small rounded lobe in front, followed by two transverse lobes, of which the anterior one is the smaller, and finally a small transverse posterior lobe; the second molar consists of two equal transverse lobes, and a small lobe behind them; the last molar consists of two simple transverse lobes."

On account of the differences observable in the structure of the teeth, and form of the skull, combined with the hairy nature of the tail and ears, Mr. Waterhouse regarded this animal as constituting a sub-genus, and proposed for it the name of *Phleomys*¹, this name being suggested by the habit of the animal, which Mr. Cuming (after whom the species is named) states, feeds chiefly on the bark of trees. It may be thus characterized:

MUS (PHLEOMYS) CUMINGI. *M. vellere setoso, suberecto, pilis lanuginosis intermixtis; auribus mediocribus extus pilis longis obsitis; mystacibus crebris et perlongis; pedibus permagnis et latis, subtus nudis; caudâ mediocri, pilis rigidis et longis (ad Murem Rattum ratione habitâ) crebrè obsitâ: colore nigrescenti-fusco sordidè flavo lavato, subtus pallidiore; caudâ nigrescente; pilis longioribus in capite et dorso nigris.*

	unc.	lin.
Longitudo capitis corporisque	19	0
— caudæ.....	13	0
— antepedis (unguis exclusis)	1	8½
— tarsi	2	10
— curis	1	0
— cranii ossei	2	4
Latitudo ejusdem	1	8½

Hab. apud insulam Luzon.

Some notes on the birth of the Giraffe at the Society's Menagerie were communicated by Professor Owen.

Of this paper the following is an abstract.

Connexion took place between the female Giraffe and the lighter-coloured male on the 18th March, 1838, and again on the 1st of April.

The young animal was a male, and was born June 9, 1839, being 444 days, or fifteen lunar months, three weeks, and three days, since the last observed, and, in all probability, the last coitus.

The new-born animal came into the world, like other Ruminants, with the eyes open, and the hoofs disproportionately large. The skin was marked as distinctly as in the adult, with large angular

¹ Φλοιός, bark (φλοιώ, to decorticate), and Μύς.

spots, which were somewhat darker than those of the mother; and the hair of the legs was of a deeper fawn colour. It sucked some warm cow's-milk from a bottle with avidity, and once or twice uttered a low, gentle grunt or bleat, something between that of a fawn and a calf. The young creature made several efforts to stand, raising itself on the fore knees; and was able to support itself on its vacillating and outstretched legs, about two hours after its birth.

"No one could have seen the young Giraffe," says Professor Owen, "without being struck with its large size, compact figure, and strength of limb. The condition or purpose of the long gestation is, evidently, to bring into the world the young Giraffe of a stature and strength suitable to the exigencies of a denizen of the desert—the birthplace, likewise, of the Lion and other destructives." The length of the animal, measuring from the muzzle to the root of the tail, was six feet ten inches; the girth of the trunk was two feet nine inches; from the tuber ischii to the patella was one foot four inches; from the patella to the apex of the hind hoof three feet; from the olecranon to the carpus was one foot ten inches; from the carpus to the end of the fore hoof was one foot eleven inches. These segments of the fore leg were thus nine inches longer than the corresponding ones of the hind leg; and as this disproportion does not exist in the adult, it offers another instance of the precocious developement of the anterior extremities in the mammiferous fœtus.

She would not yield her milk to, or even suffer her offspring to come near her. The young Giraffe was nourished by warm cow's milk. It gamboled actively about when one day old, and continued, without appearance of illness, till the 28th of June, when it was attacked by convulsions, and died.

A paper was read "On the polarizing property of living animals and animal substances upon the rays of transmitted light," by Mr. J. F. Goddard.

In this communication Mr. Goddard first alluded to the double refractory (polarizing property) exhibited by the lenses of the eyes of fishes and several other animal substances, an account of which was published in 1816 by Sir D. Brewster.

On repeating these experiments, Mr. Goddard, after observing that the scarf skin of the human subject, sections of human teeth, the finger nails, bones of fishes, and other substances, possessed the same property, was led to examine some living objects, when he discovered that among others, the larvæ and pupæ of a gnat (*Corthra plumicornis*) possessed this property in an eminent degree. The extraordinary transparency of this little insect is such, that the whole of its internal structure is beautifully displayed, and when viewed by polarized light, presents the most splendid appearance; the peculiar interlacing of the muscles of the body, dividing it into regular parts, present (as the insect changes its position with regard to the plane of polarization) the most varied hues and brilliant co-

lours. Mr. Goddard stated that the same phenomena may also be seen, if possible, in a more splendid manner, in the spawn of many large fishes, which, in their early state are sometimes equally transparent, particularly those species which inhabit the sea.

The polarizing property of various substances was beautifully exhibited by Mr. Goddard, by means of his "Polariscope."

July 9, 1839.

The Rev. J. Barlow in the Chair.

A letter addressed to Col. Sykes by Sir John McNeill was read. It related to a Dog recently presented by that gentleman to the Society. This kind of dog, Sir John McNeill states, is used by the wandering tribes in Persia to guard their flocks: it is a shaggy animal, nearly as large as a Newfoundland, and very fierce and powerful. The dam of the animal at the menagerie killed a full-grown wolf without assistance.

A letter from Augustus Elliott Fuller, Esq., was read. In this letter, which is addressed to the Secretary, and is dated June 29, 1839, Mr. Fuller encloses an account from his head keeper, Henry Cheal, respecting two broods of Woodcocks (*Scolopax rusticola*), which were bred in the woods of Mr. Fuller's estate at Rose Hill in Sussex.

The two broods referred to consisted each of four birds, and when first observed, about the second week in April, they could but just run; as they grew very fast, however, they were soon able to fly. Mr. Fuller's keeper believes the young woodcock is able to run as soon as hatched, and states that, according to his own observation and the report of others, they always build in a small hole, which they make on the plain ground: they select a dry situation for the nest; but this is placed near a moist soil, to which the old birds lead their young to procure food.

Mr. Waterhouse pointed out the distinguishing characters of a new species of Toucan, which had been forwarded to the Society by the President, the Earl of Derby, for exhibition and description.

This species of Toucan approaches most nearly in size and colouring to the *Pteroglossus hypoglucus* of Mr. Gould's Monograph; but the beak, which is totally black, is much smaller, and less arched; the nostrils do not extend so far forwards, and are hidden by the feathers of the head, and there is no longitudinal groove in front of them, as in the species above named, and others of the genus; the blue of the under parts of the body is of a much paler and purer tint, and the feathers on these parts are white at the base. It differs, moreover, in having the throat and cheeks white, and the upper tail-coverts black.

A totally black beak being an uncommon character in the species belonging to the subgenus *Pteroglossus*, Mr. Waterhouse proposed for this new species the name *nigrirostris*, and proceeded to characterize it as follows:

PTEROGLOSSUS NIGRIROSTRIS. *Pt. rostro, capite summo, nuchâque nigris; guld albâ; corpore suprà olivaceo-fusco; rectricibus se-*
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condariis olivaceo-viridibus; uropygio pallide sulphureo: caudâ, tectricibus caudæ, nigrescenti-viridibus, plumis quatuor intermediis ad apicem, femoribusque castaneis: corpore subtus pallide cyaneo, criso coccineo, pedibus nigris.

Long. tot. 20 unc. ; rostri, $3\frac{2}{12}$; alæ, $6\frac{3}{4}$; caudæ, 7; tarsi, $1\frac{1}{2}$.
Hab. —?

Mr. Fraser read his descriptions of two new species of Birds, from a collection made in the Island of Luzon, and recently forwarded to the Society by Hugh Cuming, Esq., Corresponding Member. The first of these belongs to the family *Cuculidae*, the genus *Phœnicophaeus*, and to Mr. Swainson's subdivision of that genus, to which he has applied the name *Dasylophus*. It may at once be distinguished from all the known members of the family by the singular structure of the feathers of its crest and throat: the shafts of these feathers are expanded at their extremities into laminae, which may be compared to the shavings of whalebone; and in this respect they resemble the feathers of the crest of the Toucan, to which Mr. Gould in his Monograph applies the name *Pteroglossus ulocomus*, which is the *Pt. Beauharnesii* of Wagler*, but are not curled as in that species.

The feathers above the nostrils, of the crest and chin, and along the middle of the throat, are gray at the base; have a decided white spot towards the middle, and are terminated by a broad expansion of the shaft, which is of a glossy black colour, and exhibits blue or greenish reflections. The external edge of this expanded portion of the shaft is minutely pectinated. The occiput and sides of the head are gray, passing into dirty white on the cheeks and sides of the throat: the hinder part and sides of the neck, and the breast, are of a deep chestnut colour; the back, wings, and tail are of a deep shining green colour; all the tail-feathers are broadly tipped with white; the vent, thighs, and under tail-coverts are dusky brown, tinged with green; the bill is horn-colour, and the feet are olive.

This beautiful and interesting species Mr. Fraser proposed to name after its discoverer Mr. Cuming. Its principal distinguishing characters may be thus expressed:

PHœNICOPHAUS CUMINGI. *Ph. cristatus, plumis cristæ et guttulis laminis corneis ovalibus splendide nigris terminatis; nuchâ, et pectore castaneis; facie pallide cinered; alis et caudâ metallice virescentibus, hâc ad apicem albâ.*

Long. tot. 16 unc. ; rostri, $1\frac{1}{2}$; alæ, 6; caudæ, 8; tarsi, $1\frac{1}{4}$.

To the bird above described the following memorandum was attached:—"Ansic En Bicol, language of Albay. Eyes red, pupil large and black, length from beak to tail, $8\frac{1}{2}$ inches, around the body 5 inches." Signed H. Cuming.

The second bird characterized by Mr. Fraser is a new species of Duck (*Anas*), which is nearly allied to the *Anas superciliosa*, Gmel.,

* Oken's *Isis* for 1832, part iii. p. 279; also in the 'Ausland,' 1830, No. 118, p. 470.

but differs in being of a smaller size, in having the whole of the plumage much lighter in colour, and in the sides of the head and neck being rufous, instead of pale buff: it moreover has but one dark stripe on the side of the head, whereas *Anas superciliosa* has two.

The middle of the forehead, crown of the head, and a line down the back of the neck, are dark brown; from the bill to the eye, and thence to the occiput, is a brown line, which is separated from the crown of the head by a broad stripe, which is of a pale rufous tint; the cheeks, sides of the neck, chin, and upper part of the throat, are of the same colour; the whole of the body is brown, becoming gradually darker on the rump and tail feathers: all the feathers on the upper parts are edged with pale rufous; the wing coverts are crossed by a narrow white band near their extremity, and terminate in a deep velvet-like black colour; the *speculum* is deep glossy green, with purple reflections, and bounded behind by velvety black; to this succeeds a narrow white line: the bill and feet are apparently dark olive.

To this species Mr. Fraser applies the name *Luzonica*: it may be thus characterized:

ANAS LUZONICA. *An. suprà cinereo-fusca, vertice nigrescenti-fusco; strigâ super oculari, genis, et gutture, pallidè castaneis; speculo alarum purpureo-virescenti, anticè et posticè nigro marginato; corpore subtùs fuscescenti-cinereo.*

Long. tot. 21 unc.; rostri, $2\frac{1}{4}$; alæ, $8\frac{3}{4}$; caudæ, $4\frac{1}{2}$; tarsi, $1\frac{1}{2}$.

A collection of Birds from South Australia was exhibited. This collection, recently presented to the Society by the South Australian Company, contains the following species:—

Falco melanogenys, Gould. Native name, *Monkah*.

Falco Berigora, Vig. et Horsf. Native name, *Car-cown, ya*.

Falco Cenchroides, *Cenchrus Cenchroides*, Gould. Native name, *Monne-monnie*; Golden Hawk.

Athene fortis, Gould. Native name, *Ounda-ÿ-papa*.

Ægotheles lunulata, Jard. et Selb. Native name, *Na-nie*; Night Hawk, or Eve-jar of the colonists.

Dacelo gigantea, Leach. Native name, *Cracow-Kata*; Laughing-Jackass of the colonists.

Grauculus melanops, Vig. et Horsf. Native name, *Ora*.

Cracticus hypoleucus, Gould. Native name, *Corow-Raw*; Whistling Magpie of the colonists.

Platycercus Pennantii, Vig. Native name, *Na-kall-ya*; Rosetta Parrot of the colonists.

Nanodes undulatus, Vig. et Horsf. Native name, *Tir-cou-ce*; Scalp Parrot of the colonists.

Trichoglossus concinnus, Vig. et Horsf.

Trichoglossus purpureus. Native name, *Warrow-Ka*.

Meliphaga Novæ-Hollandiæ, Vig. et Horsf. Native name, *Wardow*.

Anthochæra rufofularis. *Acanthegonyx rufofularis*, Gould.

Sitella melanocephala, Gould. Native name, *Coolta-tacoow*.

Coturnix Australis, Temm. Native name, *Tou-ta-wa-tee*.

Coturnix pectoralis, Gould. Native name, *Tou-ta-wa-tee*. This is no doubt the male of the preceding species.

Charadrius nigrifrons. *Egialitis nigrifrons*, Gould.

Rallus Philippensis, Less. Native name, *Eerncou*; Land-Rail of the colonists.

Porphyrio melanotus, Temm. Native name, *Cow-oue*; Bald Coot of the colonists.

Nycticorax Caledonicus, Less.

Anas superciliosa, Gmel. Native name, *Tow-an-da?*

Rhynchospis Rhyncotis, Steph.

Cygnus atratus, Shaw.

Phalacrocorax Carboides, Gould. Native name, *Yal-tow*; Black Shag of the colonists.

Mr. Fraser, who brought these birds severally under the notice of the meeting, and who at the same time furnished the above list, observed that the chief interest attached to this collection consisted in the locality in which it was formed, as naturalists were no doubt anxious to learn the geographical ranges of the Australian birds.

July 23, 1839.

William Yarrell, Esq., Vice-President, in the Chair.

A collection of 68 Bird-skins, made by Capt. Belcher on the west coast of South America, and presented to the Society by the Lords Commissioners of the Admiralty, was exhibited, and commented on by Mr. Vigors.

Among other observations, Mr. Vigors directed the attention of the Society to typical or leading characters, of the various groups of which specimens were found in the collection; and pointed out the relations which subsist between the great primary groups of his own system of ornithology, and the different situations they are fitted to occupy,—the earth, the water, the air, the forests, and the marshes. Mr. Vigors afterwards went over the collection in detail, and made many interesting observations respecting the habits and relations of the different species.

The following paper, on the production of Isinglass from Indian Fishes, was read by Dr. Cantor, Corresponding Member:

"In the December number, 1838, of Parbury's Oriental Herald appears a letter 'On the Suleah Fish of Bengal, and the Isinglass it affords': the description of this fish I shall quote in the words of the anonymous writer. 'The Suleah Fish,' he observes, 'when at its full size, runs about four feet in length, and is *squaliform*, resembling the Shark species in appearance, but exhibiting a more delicate structure than the latter. The meat of this fish is exceedingly coarse, and is converted by the natives, when salted and spiced, into "burtah," a piquant relish, well known at the breakfast-tables of Bengal. The bladder of the *Suleah* may be considered the most valuable part of it, which, when exposed to the sun and suffered to dry, becomes purely pellucid, and so hard that it will repel the edge of a sharp knife when applied to it. These bladders vary from half a pound to three quarters of a pound avoirdupois in weight, when perfectly dry. . . . The *Suleah* Fish abounds in Channel Creek, off Saugor, and in the ostia or mouths of all the rivers which intersect the Sunderbuns, and are exceedingly plentiful at certain seasons.'

"Conceiving the great importance of the discovery of isinglass being a product of India, I was naturally anxious to examine the source, arising from a branch of natural history to which in particular I have devoted my attention; but from the general nature of the description, I was obliged to defer my desire of identifying the fish till some future opportunity should enable me to do so. Quite unexpectedly, however, a few days ago, the last overland despatch brought me a letter from my valued friend Mr. McClelland, a Corresponding Member of this Society, an extract of which, bearing upon the point

in question, I lose no time in laying before the Society :—‘ . . . I have now to mention what is of far greater importance in another point of view, namely, that the Suleah Fish described in a recent number of Parbury’s Oriental Herald is the *Polynemus Sele* of Hamilton. I have examined that species, and found an individual of two pounds weight to yield sixty-five grains of pure isinglass, an article which here sells at sixteen rupees (1*l.* 12*s.*) per lb. Refer to your dissections of *Polynemi*; mark those with large air-vessels to be isinglass, requiring no other preparation than merely removing the vascular membrane that covers them, washing with lime-water, and drying in the sun. You know the size these fishes attain, and the number in which they abound in the Sunderbuns; you also know the method of taking them, and can therefore state to what extent isinglass may be obtained in India. I have sent a paper on the subject to the Journal of the Asiatic Society, which I will send you by the next overland despatch.’

“ Perceiving by this that the subject has been taken up by a naturalist of Mr. McClelland’s rank, and that we ere long may expect his observations embodied in a paper from his hand, I think it sufficient to confine myself to a few general remarks upon those species of *Polynemus* which have come under my actual examination while I was attached as surgeon to the Hon. Company’s survey of the sea-face of the Gangetic Delta.

“ The species best known is the *Polynemus risua*, Hamilton; *Pol. longifilis*, Cuvier; the Tupsee or Mango Fish of the Anglo-Indians; this inhabits the Bay of Bengal and the estuaries of the Ganges, but enters the mouths of the rivers, even higher up than Calcutta, during the breeding-season (April and May), when the fish is considered in its highest perfection, and is greedily sought as a great delicacy. This species is the smallest, for its length seldom exceeds eight or nine inches, and one and a half to two inches in depth. *Polynemus aureus* and *Topsui*, Hamilton, are species closely allied to this.

“ *Polynemus sele*, Hamilton, *P. plebeius*, Broussonnais, *P. lineatus*, Lacépède, is the Suleah Fish mentioned in Parbury’s Oriental Herald, the same which Mr. McClelland submitted to examination. This species, as well as another closely allied to *P. quadrifilis*, Cuvier, which I have dissected, figured, and described, under the name of *P. Salliah* (*Saccolih*), appears equally plentiful, in shoals, all the year round in the estuaries of the Ganges, and is appreciated by Europeans and natives for its excellent flavour. Both species attain a size from three to four feet in length, and eight to ten inches in depth.

“ In a paper which I had the honour of communicating to the Royal Asiatic Society*, the genus *Polynemus*, among others, was pointed out by me as forming an article of food fit for curing, and easily procurable in almost any quantity: by the discovery that it

* Published in the Journal of the Royal Asiatic Society of Great Britain and Ireland, No. ix., August 1838, p. 165.

produces isinglass, it has attained an additional interest; and I have no doubt the manufacture of this article will, when entrusted to judicious hands, form another valuable article of exportation from India."

Mr. Ogilby called attention to a new species of Squirrel sent from the west coast of South America, by Capt. Belcher, at the same time as the bird-skins noticed by Mr. Vigors. This species more nearly resembles the Coquallin of Buffon (*S. variegatus*, Gmel.) than any other with which I am acquainted. It is, however, much smaller; rather less indeed than the common European Squirrel, and differs both in the colours themselves and in their distribution. The whole upper surface of the head and nape, as well as the cheeks of the Coquallin, are intense and uniform black; the ears and muzzle are pure white; the black and light-yellowish brown colours of the back are finely intermixed, or as it were granulated, whilst the long hairs of the tail are yellowish red at the roots, glossy black in the middle, and intense red on the terminal portion. In the new species, on the contrary, the head, muzzle, cheeks, and neck, are of the same colour as the back; the ears are but thinly covered with short hair, and that of a sandy red colour, surrounded by a narrow black border, most conspicuous in front; the back colours are brindled, or mixed in wavy irregular patches, and the long hairs of the tail are mostly black, terminated by snowy-white tips, which give the whole organ a hoary appearance; many of these hairs, however, have yellowish gray roots. The limbs and under-surface of the body, in both species, are red, but in the present species it is of a lighter and more yellowish cast.

For this species Mr. Ogilby proposed the name *variegatoides*: its chief characters are as follow:

SCIURUS VARIEGATOIDES. *Sc. suprà fulvo nigroque variegatus; subtùs helvolus; caudâ longâ, cylindricâ, floccosâ, canescente; auriculis imberbibus, subrufis, nigro marginatis.*

	unc. lin.
Longitudo ab apice rostri ad caudæ basin . . .	10 0
— caudæ	11 0
— tarsi digitorumque	2 6
— auris	0 9
— ab apice rostri ad basin auris	2 1½

A new species of Squirrel, sent by Hugh Cuming, Esq., Corresponding Member, from one of the Philippine Islands, was thus characterized by Mr. Waterhouse :

SCIURUS PHILIPPINENSIS. *Sc. suprà intenſe fuscus, pilis nigri-rufescenti-flavo annulatis, subtùs cinerescenti-albus, capite et anticis pedibus cinerescentibus; auribus parvulis; caudâ mediocri.*

	unc. lin.
Longitudo ab apice rostri ad caudæ basin	6 6
— caudæ	6 3

unc. lin.

<i>Longitudo ab apice rostri ad basin auris</i>	1	6
— <i>tarsi digitorumque</i>	1	9
— <i>auris</i>	0	3½

Hab. Mindanado.

"This species is rather larger than *Sc. Palmarum*, and less than *Sc. bivittatus*. The general hue of the upper parts, sides of the body, and outer side of the hinder legs, is deep brown (a much richer and deeper colour than the same parts in *Sc. bivittatus*) : this tint is produced by the admixture of rust colour and black, the hairs being of the latter colour, and rather broadly annulated with rusty-red near the apex. The tail is not very bushy ; the hairs are black, with two bright rusty bars. The under parts of the body are grayish white, with a faint yellow tint : the head and fore legs are grayish, and the feet are black, slightly grizzled with rust colour."

Mr. Waterhouse then proceeded to point out certain differences observable in the skulls of two species of Squirrels, which are usually confounded under the name *Sciurus Palmarum*, and the external characters of which he had pointed out in the "Magazine of Natural History" for September 1837, p. 496. The specific name *tristriatus* is there proposed for the new species.

"The skull of *Sciurus tristriatus*," observes Mr. Waterhouse, "differs from that of *Sc. Palmarum* in being a little larger, considerably broader in proportion, and in having the upper surface less convex ; the post-orbital process is larger, the width between the orbits is greater, and the nasal portion is more suddenly contracted ; the nasal bones are larger, and narrower posteriorly. Following are the dimensions of the crania of these two species of Squirrel."

	<i>Sc. Palmarum.</i>	<i>Sc. t. tristriatus.</i>
	unc. lin.	unc. lin.
Total length	1 6	1 7½
Width	10½	11½
— between orbits	5½	6½
Length of nasal bones	5½	6
From outer side of incisors (upper jaw) { to front molar tooth	5	5½
Space occupied by the five molars on { either side of upper jaw	3½	4½
Length of palate	7½	9
— of ramus of lower jaw from { front to posterior part of condyle ..	10½	1 0½

August 13, 1839.

William Yarrell, Esq., Vice-President, in the Chair.

A collection of Bird-skins, from the neighbourhood of Erzeroon, presented to the Society by E. D. Dickson, and H. J. Ross, Esqrs., was exhibited.

The species contained in this collection were brought under the notice of the Meeting by Mr. Fraser, and the following notes (made by Messrs. Dickson and Ross) which accompanied them, were read.

Buteo — ? August 20†. Very common: arrives middle of March, and leaves middle of November.

* *Falco tinnunculus*, Linn. M†. April 28. Common. Iris dark hazel. A mouse found in its stomach. This bird was perched on a tree, with some starlings and sparrows.

Falco tinnunculus, Linn. F. April 29. A bird and a frog found in its stomach. Five well-developed eggs in the ovary. Another had eight eggs, besides a great many small ones, and its stomach contained a frog and some scaly substances, probably a portion of a fish. It breeds in April, on lofty poplars, and also on the top of minarets. Arrives early in April and departs late in November.

Falco Æsalon, Temm. M. April 23. Eyes large, round, and of a bluish-black colour: rim of eyelids, cere, and legs, bright yellow. A great number of thin tough worms, from one to two inches long, between the peritoneum and muscles on the left side: neither stomach nor intestines contained any.

Milvus ater, Gould. M. May 10. Common. Shot on a tree close to the town. Eyes large, of a light cinnamon colour, and with a black ring round the iris. Testicles reniform; yellow. Arrives middle of March.

Noctua Indica, Franklin. August 1. Common about the foot of the mountains near the town.

Cypselus murarius, Ill. M. May 24. Very abundant. Arrives beginning of May, leaves late in September.

Merops Apiaster, Linn. F. May 20. Gizzard full of insects. Arrives middle of May, leaves latter end of September.

**Coracias garrulus*, Linn. September 6. Common in various localities. Arrives early, and departs late in September.

Collurio minor, Vig. August 6. Common. Frequents haycocks. Arrives beginning of August, leaves middle of September.

† The date when the specimen was procured.

* The species marked with an asterisk have been noticed in the Proceedings as inhabitants of Trebizond, a locality not far distant from Erzeroon. See Proceedings for 1834, pp. 50 & 133; for 1835, p. 90; and for 1837, p. 126.

‡ The letter M stands for male, and F for female, throughout the paper. Nos. LXXX & LXXXI.—PROCEEDINGS OF THE ZOOL. SOCIETY.

Oriolus galbula, Linn. F. September 2. Rather rare. Found in willow-trees. Arrives early in August and departs middle of September.

**Cinclus aquaticus*, Bechst. F. December 9. Very few seen. Frequenting a mountain stream. Shy : flies rather high : food, small crustacea. Eyes light hazel. Two small oval appendages, one on each side of the rectum ; hollow, and communicating with its cavity. The down on the breast very thick.

Motacilla alba, Linn. Not uncommon. Arrives end of September and departs end of October. Migratory.

Budytus melanocephala, Savi. M. June 7. Very common on moist ground : food, insects. Arrives middle of April and leaves early in November.

Phænicura ruticilla, Swains. M. April 29. A straggler : found in a garden in Erzeroon.

**Saxicola Cœnanthe*, Bechst. Eyes hazel. Frequents rills ; also found on adjacent hills.

Saxicola Cœnanthe, Bechst. M. May 27. Common all over the neighbourhood. Food, coleopterous insects and caterpillars.

Saxicola rubetra, Bechst. A few seen in April.

**Erythaca rubecula*, Swains. (In spirit.) Found in a stony ravine in November ; the only one yet noticed.

Sylvia hippolais, Penn. August 15. A few seen on high thistles, in moist situations, from the commencement of April to the middle of October. Migratory.

Salicaria Cetti? Gould. October 28. Caught in a stable after the first falls of snow. Neither this bird nor several others of the same family procured at the time had any tails.

Anthus arboreus, Bechst.

Anthus rufescens, Temm. F. June 2. Found on the adjacent hills. Gizzard filled with coleopterous insects.

Alauda Calandra, Pall. Rather numerous : frequents fields. Arrives end of October and departs late in September. Migratory.

Alauda arvensis, Linn. Very common in summer.

**Alauda* — ? Not very common. Food, the grain found among horses' dung. This variety differs from the preceding species in the construction of the bill. It is only found in winter, and occurs in flocks, in company with the Horned Lark (*Alauda penicillata*).

Alauda brachydactyla, Temm. Seen in large flocks. Only noticed from 21st of April to 28th of May. Frequents fields and the hills. The cock is of a brighter colour than the hen, and has its ears and the spot on the breast much darker.

Alauda penicillata, Gould†. Numerous : food, seeds. The specimens sent are not so bright as the living bird, probably from the effects of the arsenical soap. The males differ from the females in being of a brighter colour, and in having the black feathers on the top of the head much more distinctly marked. The yellow gorget

† Proceedings Zool. Soc. 1837, p. 126.

of both, in winter is bright, and in summer remarkably faint, while the purple on the nape is *vice versa*. During the hot months they are found on the neighbouring mountains, from which they are driven down to the plain in winter in quest of food, which consists then of the grain found in the dung of cattle, the ground being at that time covered with snow several feet in depth. They fly in companies of from three to twelve birds; are very familiar, especially so in winter, when they may be killed easily with an ordinary whip. When approached, or in the agonies of death, they erect their horn-shaped crest quite perpendicularly, with the tips curved inwards. They run on the snow with surprising rapidity: as soon as the snow has melted on the plain they return to the mountains.

**Emberiza miliaria*, Linn. M. & F. April 23, June 5. Common in the fields close to Erzeroom. Feed on corn.

**Pyrgita domestica*, Cuv. M. Excessively common. Begin to pair and build about the end of April and beginning of May.

Pyrgita petronia, Gould. M. May 28. Very common, observed in the spring and summer months in steep and stony ravines. Gizzard filled with wheat and chaff.

Fringilla nivalis? Linn. May 27. Rare: food, insects. Found in the neighbouring hills.

Linaria montana, Ray. October 14. Noticed from the 20th of September to the 18th of November, in companies.

Fringilla sanguinea, Gould†. May 28. Tolerably common. Firs appears on the neighbouring hills, and afterwards in the plains, at no great distance from them. Food, the unripe seeds of the *Cichoraceæ*. The young bird has a lighter plumage, and its skin is of a deep pink colour. Arrives in the middle of May, and departs in the middle of September.

Pterocles arenarius, Temm. M. & F. Very common. Iris dark hazel; margin of eyelids pale light yellow. Food, grain, vetches, tares, &c. Said to breed towards the end of April, on the adjoining hills, amongst loose stones. Arrives in the beginning of April; they are then seen in those fields that are free from snow, close to the town. In summer frequents bare sterile grounds. Quits Erzeroom about the end of September. Native name, *Bahghr-Kahrah* (Black Belly).

**Otis tetrix*, Linn. Very common in ploughed fields and on the skirts of the marsh. Arrives early in September, and departs in the middle of November. Native name, *Mz-mel-dek*.

Glareola limbata, Rüpp. September 8. Rare. In flocks in marshy situations.

Vanellus cristatus, Meyer. September. Very numerous. Arrives at the end of March and departs at the end of November. During summer frequents the river†, but on its arrival and previous to its departure it is found in moist fields near Erzeroom. Native name, *Kiz-Cooshoo* (Maiden's Bird), or *Kahmaum-Cooshoo* (Bath-bird).

† Proceedings Zool. Soc. 1837, p. 127.

‡ The river referred to in this paper is the *Karah-Soo*, or northern branch of the Euphrates.

Vanellus Keptuschka, Temm. September 17. A few observed from the middle of September to the middle of October. In flocks. This specimen sent had its right leg shrivelled up.

Charadrius morinellus, Linn.

Charadrius minor, Meyer. June 26. Numerous on the sandy and pebbly banks of the Aras at Hassán-Kaléh (18 miles east of Erzeroom), about the middle of June. The naked rim round the eye is of a deep sulphur colour. None of these birds have been noticed at Erzeroom.

Tringa subarquata, Temm. Numerous about the streams at So-ook-Tcherméh, a village four miles from Erzeroom.

Tringa minuta, Leisl. August. Plentiful at Tchif-lik, a village five miles distant, close to the houses, about pools, in company with sparrows and starlings.

Tringa minuta, Leisl. September 15. Abundant at the village of So-ook-Tcherméh.

Limosa melanura, Leisl. November 15. One leg had apparently wasted and dropped off, and the other was found in an incipient state of atrophy, like that in *Vanellus Keptuschka*, Temm., but not in so great a degree.

**Himantopus melanopterus*, Meyer. End of July. Not very common. On the borders of the river. A naked rim round the eyelid, of a bright vermillion colour.

Ardea alba, Linn. Not many: seen only at the river, from the commencement of May till the beginning of October. Sometimes in flocks and sometimes solitary.

Ibis Falcinellus, Temm. End of August. Seen during the hot months at the river.

Ibis — ? End of August. Not uncommon: about the river in August. Food, shell-fish: has a remarkably thick gizzard.

Fulica ater, Linn.

Tadorna rutila, Steph. August 30. Very abundant: gregarious. During the day frequents marshes, but feeds late in the evening and early in the morning, in corn and stubble-fields. Arrives in the middle of March and departs at the end of November: rarely seen in the water. Said to breed in the marshes. Great numbers on the Lake of Van in August. Native name, *Ahn-goót*.

Sterna nigra, Linn. Very common about the river during spring and summer.

The collection also contains specimens of *Cricetus accedula* (*Mus accedula* of Pallas.), which species is "very common. The eyes are large and black; cheek-pouches spacious, extending from the angles of the mouth to the back of the head, a little beyond the ear. It is one of our domestic mice. In winter it is sometimes found on the snow; its fur is then silky and glossy."

The common mouse (*Mus musculus*) is said to be very common in houses at Erzeroom.

† The Spalax (*Spalax typhlus*, Illig.), a specimen of which is also sent, is said to be "common all over the plain. Its food is roots, but it will readily eat bread: its paws are thick and fleshy: it is very expert in burrowing, which it performs with all four of its feet. The

pericardium is excessively thin and transparent, and without any traces of fibrous texture. The left lung is entire, and the right one divided into four lobes; heart, pancreas and kidneys, natural; peritoneum of exactly the same structure and appearance as the pericardium; liver five-lobed, with a small appendix; a large thick, round blotch (resembling an ulcer) on the inner surface of the great curvature of the stomach; spleen narrow, very much elongated, and adhering to the posterior and left side of the stomach; *capsulae renales* firmly attached to the upper end of the kidneys; cæcum and *appendix vermiciformis* of an enormous size, in proportion to the intestines; between the rectum and bladder a flat white substance, of a follicular structure, and terminating at its posterior extremity in a thick fleshy canal. Native name, *Kior-Seetchán* (Blind Rat.)."

Mr. Charlesworth exhibited a young shell, as he supposed, of the *Nautilus Pompilius*, which he considered worthy of notice on account of its small size, its transverse diameter not exceeding half an inch. The *umbilicus* was open throughout its entire length, and a series of elegant, and rather prominent striae were transversely disposed upon the terminal portion of the external whorl. Mr. Charlesworth remarked, that the rarity of this shell in the early stages of its growth was a singular circumstance, considering the immense number of *nautili* which are annually imported to this country. The specimen on the table was by far the smallest he had ever seen.

The plates of the first part of Sir W. Jardine's work on Scottish *Salmonidæ* were exhibited by Mr. Yarrell.

August 27, 1839.

No meeting took place.

September 10, 1839.

William Yarrell, Esq., Vice-President, in the Chair.

The following letter, addressed by M. Baillon to Mr. Waterhouse, was read. It is dated Abbeville, July 16, 1839 :—

"M. De la Motte has just informed me that when he had the pleasure of seeing you in London you expressed a wish to know the name of a new species of Goose which I described in 1833 in the catalogue of the birds observed in the department of the Somme, and which I have inserted in the 'Memoirs of the Society of Emulation of Abbeville.' To this bird I gave the name *Anser brachyrhynchus*, because it appeared to me that one of its most striking characters consisted in the shortness of its beak. This species has been sent by me, under that name, to the museums at Paris, Turin, Mayence, &c. I have also forwarded two specimens, exhibiting the young and adult states, to M. Temminck for the museum at Leyden, and this learned naturalist stated that he would give an account of the species (under the above-mentioned name) in the fourth volume of his 'Manuel d'Ornithologie.'

"In the same catalogue I described two new species of *Scolopax*, one under the name of *S. LaMottei*, and the other under that of *S. pygmaea*. M. Temminck does not admit that the first is a good species, and for the same reason he will not admit the *Scolopax Brehmii*, which, like my new species, differs only from the *Scolopax gallinago* in the number of tail-feathers. *Sc. Brehmii* has sixteen tail-feathers, whilst *LaMottei* has only twelve; the last-mentioned species differs moreover in being of a much smaller size than the common snipe. The *S. pygmaea* M. Temminck regards as a good species, and he intends to insert it in his work. Like *S. gallinago*, it has fourteen tail-feathers, but it is of a much smaller size than that species; it is even smaller than the *S. gallinula*. Two specimens of this new species, resembling each other, were killed in the same week, and furnished me with the materials of my description. A new species of *Anthus* and four new small quadrupeds are also described by me in the catalogue; two of the quadrupeds belong to the genus *Arvicola*, and the remaining two belong to the genus *Vespertilio*."

The following paper, by George Gulliver, Esq., F.R.S., Assistant-Surgeon to the Royal Regiment of Horse Guards, entitled "Observations on the Muscular Fibres of the Oesophagus and Heart in some of the Mammalia," was read.

"There seems to be considerable difference of opinion as to the extent to which the muscular fibre of animal life invests the gullet, a discrepancy which has probably arisen from the want of a sufficient number of comparative observations on the lower animals. It has

been generally concluded that this fibre is confined to the upper portion of the tube, Professor Müller, Dr. Schwann, and Mr. Skey informing us that the striated muscular fasciculi are either confined to this part of it, or belong only to the muscles of the pharynx, while MM. Ficinus and Valentin have been led to assign a much more extensive range to the fibre in question.

" From a somewhat attentive investigation of this subject during a residence in the country last spring, and without any more information as to what had been done by others than is to be found in Mr. Skey's paper, it appeared to me not only that the muscular fibre of animal life extended much further towards the stomach in certain brutes than in man, but that there was also a remarkable difference in this respect even among different genera of animals. Hence I propose to communicate to the Society a short account of my observations, with the impression that they will tend as well to reconcile the discordant results of others, as to direct attention to a field of inquiry which may prove of much interest, both as regards the physiology of the muscular tissue and of an important part of the alimentary apparatus.

" 1. In the Dog (*Canis familiaris*, Linn., and *C. familiaris var. Australasiae*, Desm.) the muscular sheath, from its commencement to its termination in the stomach, was found to be composed entirely of distinct fibres everywhere marked with the striae, which appeared to be of two distinct sizes, without intermediate gradations. Of the largest, two and a half or three occupied a micrometer space of 1-4000th of an inch, while five of the smaller were required to cover the same extent, the latter presenting a much more acute appearance than the former; so the large striae were from 1-10,000th to 1-12,000th of an inch broad, and the small marks 1-20,000th. The fibres were of the same diameter as those of the sartorius muscle, both being larger than in the heart of the same animal.

" 2. In the Fox (*Canis Vulpes*, Linn., and *Canis Vulpes, var. Americanus*), to within half an inch of its termination it was composed wholly of the striated muscular fibre, and this structure, mixed with the muscular fibre of organic life, extended as far as the stomach. The diameter of the striated fibre, or bundle of ultimate filaments, was from 1-666th to 1-333rd of an inch, which much exceeds the magnitude of the fibre in the heart of the same animal.

" In the Silvery Fox (*Canis argentatus*, Desm.) the striated fibres were abundant to within half an inch of the termination of the gullet: in the Arctic Fox (*Canis lagopus*, Linn.) they were detected to its end, though in the former they could not be seen so near to the stomach.

" 3. In the common Otter (*Lutra vulgaris*, Desm.), the striated fibres were detected abundantly to within half an inch of the cardiac end of the gullet. The fibres were from 1-800th to 1-500th of an inch in diameter. In the heart they had a diameter varying from 1-2000th to 1-1143rd of an inch.

" 4. In the Domestic Cat (*Felis Catus*, Linn.) the muscular sheath of the oesophagus consisted wholly of striated fasciculi to about a

quarter of an inch below the superior border of the sternum. The bundles were from 1-1600th to 1-1143rd of an inch in diameter. Nearer to the stomach the muscular fibres of animal life were mixed with those of organic life, the former being completely lost within half an inch of the cardiac end of the oesophagus. The muscular fasciculi in the heart were very indefinite, but manifestly smaller than in the gullet.

" 5. In the Asiatic Leopard (*Felis Leopardus*, Desm.) the muscular fibre of animal life was seen to within one inch and three quarters of the cardiac end of the gullet. In this situation, and about half an inch further up, the striae were remarkably small and faint. Three inches from the stomach the muscular fibre was almost entirely that of animal life. The fascicles measured from 1-500th to 1-333rd of an inch in diameter; in the heart, from 1-2666th to 1-666th, 1-1000th being a common size.

" 6.. In the Lynx (*Felis Lynx*, Linn.) the muscular tunic was composed entirely of the striated fibre to within seven inches and a half of the stomach. Many of the striae were very large, and separated by rather wide intervals, viz., about 1-8000th of an inch. Two inches higher the striae were generally of the finer kind. About six inches from the stomach the muscular fibre of animal and that of organic life were mixed in about equal proportions; and the former was lost in a little more than an inch lower down. The fibres of the latter were riband-like, about 1-4000th of an inch broad, and containing distinct corpuscles, as in the horse. The fascicles of the former were from 1-1000th to 1-666th of an inch broad. In the heart the fascicles presented a diameter varying from 1-2000th to 1-800th of an inch; 1-1333rd of an inch was a common size.

" In the Caracal (*Felis Caracal*, Linn.) some ill-defined fasciculi were observed to within half an inch of the cardia, but no striae could be seen nearer to it than an inch and a half. Three inches and a half from the end of the gullet the fasciculi were distinct and general, but the striae faint and often invisible. The riband-like fillets in the organic muscular tissue could not be detected.

" 7. In the Common Rat (*Mus decumanus*, Desm.) the muscular fibre was throughout fasciculated and transversely marked, without any visible intermixture of fibre of a different character, even close to the stomach. The striae were chiefly, if not exclusively, of the larger kind.

" 8. In the Common Guinea Pig (*Cavia Cobaya*, Desm.) the striated fibres extended to the stomach; they measured from 1-1600th to 1-400th of an inch in diameter. In the heart their diameter was from 1-2000th to 1-800th of an inch.

" 9. In the common Rabbit (*Lepus Cuniculus*, Linn.) the striated fasciculi extended to the termination of the gullet, and even to a short distance on the cardia.

" 10. In the Horse (*Equus Caballus*, Linn.) the muscular sheath, to within seven or eight inches of its cardiac end, was constituted altogether of the striated fasciculi, having a diameter varying from 1-444th to 1-266th of an inch. The striae were both of the large

and small varieties, the former being, as usual, sharp and well-defined in their course, without any appearance of a granular arrangement; while the former appeared to be composed of very minute globules, extremely regular in size and shape, the striae apparently resulting from the exact apposition laterally of the granules, and of the depressions or spaces between them. The diameter of the granules was about 1-16000th of an inch. Some of the transversely marked fibres could be traced on the outer surface of the gullet as far as four and a half inches from its termination, but they were completely lost on the inner muscular layer one inch and a half nearer to the pharynx than here indicated. The diameter of the muscular fasciculi in the heart was from 1-1333rd to 1-666th of an inch.

" The remaining portion of the muscular fibres, as far as the stomach, was chiefly composed of the riband-like filaments, varying from 1-3000th to 1-2900th of an inch in diameter. These were everywhere pervaded by irregular corpuscles from 1-4000th to 1-2000th of an inch in diameter, giving to the gullet a knotted appearance, with about 1-500th of an inch longitudinally between these bodies.

" 11. In the Fallow Deer (*Cervus Dama*, Linn.) almost the whole extent of the muscular tunic was made up of the striated fibres, which could be detected in the last portion of the oesophagus, though mixed about two inches above the stomach with the muscular fibre of organic life. There was a considerable quantity of tissue, composed of longitudinal filaments, riband-like, apparently quite flat, with very distinct margins, and each measuring transversely from 1-4000th to 1-3000th of an inch. Portions of the striated fibres often seemed to terminate insensibly in these riband-like filaments.

" 12. In the Calf (*Bos Taurus*, Desm.) the muscular covering presented the striated fibres to within half an inch of the stomach. The striae were generally of the larger kind. Only one observation was made with this animal, and that in a foetus at the seventh month of utero-gestation.

" 13. In the Sheep (*Ovis Aries*, Desm.) it was composed entirely of fibres, measuring from 1-666th to 1-250th of an inch in diameter, the striae being both of the sharp and small, and of the large and obscurely globular varieties. Some of the transversely-marked fibre was also detected extending for three quarters of an inch on the great end of the stomach, among the muscular fibre of animal life in that situation.

" 14. In the Bearded Sheep (*Ovis Tragelaphus*, Desm.) the striated fibre extended to within half an inch of the termination of the gullet. The fascicles were very variable in diameter, viz., from 1-2000th to 1-400th of an inch. In the heart they measured from 1-777th to 1-1143rd.

" 15. In the Cashmere Goat (*Capra Hircus*, var.) the striated fibre was continued down to the stomach, being found abundantly on the last portion of the oesophagus. A common diameter of the fibres was 1-666th of an inch; in the heart they measured from 1-2666th to 1-1333rd of an inch.

" 16. In the Coati (*Nasua fusca*, Desm.) the oesophageal muscular

fibre was almost entirely of the striated kind, there being but very little of the muscular fibre of organic life, even close to the stomach. The fascicles measured from 1-888th to 1-333rd of an inch in diameter.

" 17. In another Coati (*Nasua rufa*, Desm.) the striated fibre extended to the stomach; the outer layer was composed entirely of the muscular fibre of animal life, the fibres being longitudinal, and easily separable from the inner layer, which latter near to the stomach was composed of the muscular fibre of organic life.

" 18. In the Sloth Bear (*Ursus labiatus*, Blainville) the muscular tunic of the gullet was remarkably strong and red, being about an eighth of an inch thick in the neck, and increasing to a fourth of an inch near the stomach. The striated fibre was detected throughout, and extended some distance on the cardiac end of the stomach. The fibres were generally large, viz., about 1-400th of an inch in diameter; in the heart from 1-2000th to 1-1000th.

" 19. In the Capuchin Monkey (*Cebus capucinus*, Desm.) the striated fascicles were found abundantly, mixed with the muscular fibre of organic life, two inches from the cardiac end of the oesophagus. The fibres measured from 1-800th to 1-500th of an inch in diameter.

" 20. In the Lemur (*L. Albifrons*, Desm.) no striated fibres could be seen within an inch and a half of the termination of the gullet. In the Green, Grivet, Mangabey, and Rhesus Monkeys (*Cercopithecus Sabaeus*, *C. griseo-viridis*, *C. Aethiops*, and *Macacus Rhesus*), the striae could not be observed within an inch and a quarter of the cardia, though several well-marked fasciculi were seen in this situation, presenting a homogeneous or very irregular and slightly granular appearance, as if not composed of primary fibrils. An inch further from the stomach the striated fasciculi were abundant. In the Dog-faced Baboon (*Cynocephalus Anubis*,) Mr. Siddall could only trace the striated fibres as far as three inches and a half from the stomach; in a Gibbon Monkey† he saw them no nearer to the cardia than an inch and a half; and in a Barbary Ape the striated fibre was lost on the gullet two inches from the stomach.

" Professor Müller assures us that 'the third act of deglutition is perfectly involuntary, being performed by the muscular fibres of the oesophagus, which are not in the slightest degree capable of voluntary motion.' If this statement be correct, some of the facts adduced in this paper are remarkable, since they are examples of complete identity of structure between the muscular fibres of the last portion of the gullet and the known muscles of voluntary motion; and this identity, according to my observations, is not deduced from one appearance alone, but in several instances from a combination of characters, which I am not aware that any perfectly involuntary muscle hitherto described presents; i. e. the ultimate filaments formed into fasciculi, considerably larger than in the heart, well-defined, agreeing

† To the caecum of this Gibbon there was an *Appendicula*, which was not the case in any of the other Quadrupeds mentioned in this paper.

in size with those of the voluntary muscles generally, pervaded by the two kinds of striae, and unmixed with the muscular fibre of organic life.

" It may be remarked, that however adverse the appearance of the very definite, sharp, and minute transverse markings may be to the views of Sir Everard Home in regard to the constitution of the ultimate muscular filament, still that the larger striae are formed from the lateral apposition of granules, as maintained by Professor Müller, seems to be very probable. This may often be seen in the œsophageal fibre of the horse, and still better in the heart of this and other animals. Yet the beaded arrangement cannot be detected in the acute and smaller striae, and the character of these appears to me to be so distinct and constant, never running by insensible gradations into the larger kind, and unaffected by any modifications of light or manipulation, that it is not improbable that there is an essential difference between them. This view also receives support from the fact, that in the heart of several animals none of the smaller transverse marks are present, the ultimate tissue being throughout granular, and presenting only the larger or more indefinite kind of striae.

" It is remarkable too that in this organ the character of the muscular fibre is altogether peculiar, being constituted exclusively, as before mentioned, without a visible intermixture of any other tissue whatever. Nothing can be seen in the heart like the fibre described in the last portion, either of the gullet of the horse or of the fallow deer, or indeed similar to the muscular tissue of organic life belonging to the membranous viscera of the abdomen; and if the cellular substance exist between the cardiac muscular fasciculi, it must be in a form agreeing in some respects with the ingenious hypothesis of Bordeu.

" In the preceding observations generally the muscular fibre of animal life extended further towards the stomach in the outer than in the inner layer of the œsophageal muscular sheath. Thus, in the Otter the striated fasciculi were abundant in the former portion to within half an inch of the termination of the gullet: within an inch and a half on the surface they were entirely of this kind; while the muscular fibre of organic life formed the inmost layer nearly four inches anteriorly to this point.

" In the Horse, Lynx, and Deer, the organic muscular fibre, as figured and described by Dr. Baly, was remarkably distinct. In the first the fillets were larger than in the others, and in the last the corpuscles were not seen. In many of the other observations these peculiar riband-like fibres were either less evident or not to be detected by the most careful examination, even in that part of the gullet where the striated fibre constituted but a small part of, or was altogether absent from, the muscular sheath."

A paper communicated by Dr. Lhotsky, and entitled " Some Remarks on Animal Tuition," was read.

Dr. Severn exhibited a species of *Balistes*, which had been caught on the coast of New Zealand.

September 24, 1839.

The Honourable Sir Edward Cust in the Chair.

A letter from R. J. Bourchier, Esq., Corresponding Member, dated Malta, Sept. 5, 1839, was read. It stated that Mr. Bourchier had forwarded a young Lioness to the Society, which Sir Thomas Reade, Honorary Member, had sent to Malta for that purpose.

A letter from Col. Warrington, Corr. Memb., was read. This letter, which is dated Tripoli, July 20, 1839, states that Col. Warrington had forwarded to the Society two small boxes, containing preserved specimens of natural history, and some living gundies. (*Ctenodactylus Massonii*.)

A letter from E. D. Dickson and H. J. Ross, Esqrs., dated Erzer-room, July 18, 1839, was read. It referred to a collection which these gentlemen had forwarded for the Society's Museum. The specimens alluded to in this letter having arrived, were severally brought before the Meeting by Mr. Fraser, and the following notes which accompanied them were read:—

Accipiter fringillarius, Ray. Procured April 3. Male. Found in the stomach small birds. Iris bright orange; margins of eyelids yellowish; bill blue, with black tip; cere yellowish green; legs yellow; claws black. Total length 12·5 inches. Shot near the town.

Falco subbuteo, Linn. Procured May 22. Total length about 12 inches. Bill bluish; legs orange; claws black. The only specimen we have yet seen. Female.

Circus pallidus, Sykes. Procured April 4. Iris bright yellow, with yellow margin to the eyelids; bill bluish; cere greenish yellow; legs orange yellow, with black claws. Total length 17 inches. This year (1839) arrived March 24, and left April 7; last year they arrived March 8 and left May 1. They were then also much more numerous than this year, and most abundant in April.

* *Circus rufus*, Briss. One specimen, a male, procured May 8. Found in the stomach frogs and mice. Shot close to town. Legs pale yellow. A second specimen procured May 24. Found in the stomach a Tern (*Sterna nigra*). Iris bright sulphur-yellow; legs pale dirty yellow. Common about the river: they are shy, but bold.

Hirundo rustica, Linn. Procured April 25. Found in the stomach insects. Iris dark brown; bill and legs black. Total length 8·5. Arrives April 20, and remains here the whole summer; very

* The species marked with an asterisk have been noticed in the Proceedings as inhabitants of Trebizond, a locality not far distant from Erzer-room.—See Proceedings for 1834, pp. 50 and 133; for 1835, p. 90; and for 1837, p. 126.

numerous all over the plain : builds under eaves ; the nest is made of mud, straw, and coarse large feathers, neatly lined with fine hay, over which there is a layer of feathers ; eggs four, white, speckled with brown.

Lanius Collurio, Linn. One specimen, a male, procured April 20. Found in the stomach Coleopterous insects. A second, a female, procured May 4 : found in the stomach worms, &c. Total length 7 inches. A small number seen together in a burying-ground.

Muscicapa grisola, Linn. Found in the stomach insects. Very common in May, in the burying-grounds, and also in fields.

Muscicapa luctuosa, Temm. Procured April 8. Found in the stomach insects. Shot in a burying-ground. No others have been seen.

Turdus merula, Linn. Procured March 28. Found in the stomach insects. Observed from March 28 to April 7 about burying-grounds, &c. Said to be common in winter both at Tortoom and Trebizond.

Turdus pilaris, Linn. Procured April 1. Found in the stomach beetles. Only one seen ; on moist ground.

**Turdus musicus*, Linn. Procured March 28. Found in the stomach Coleopterous insects. Seen from March 23 to April 19 : frequents the gardens and ditches near town, and also the roofs of houses. Common. Said to be numerous at Tortoom in February.

Petrocincla saxatilis, Vig. Procured April 19. Found in the stomach insects. Iris brown ; bill and legs dusky. Total length 8·5 inches. Found near the river, on moist ground. Another was seen April 22 in a burying-ground near the town.

Sylvia Hippolais, Temm. Found in the stomach small insects. There are two varieties, both of which were sent on a former occasion.

**Currucina cinerea*, Bechst. Procured May 11. Found in the stomach insects. Total length 5·5 inches. Only two seen ; one in a ditch, and the other in a burying-ground.

Salicaria phragmitis, Selby. Procured May 11. Found in the stomach insects. Frequent bogs and other moist localities.

Phænicura Tithys, Jard. and Selb. Procured April 17. Found in the stomach small *Coleoptera*. The only specimen found. Bill and legs black.

**Phænicura Suecica*, Jard. and Selb. Procured March. Found in the stomach small insects. Common about rills from March 28 to April 22. Total length 5·7 inches. Subject to several varieties of plumage.

Saxicola rubicola, Bechst. Procured April 19. Found in the stomach small *Coleoptera*. Burying-grounds, and the vicinity of moist ditches. Common. Seen from 19th of April to the present time.

Alauda arborea, Linn. Procured April 19. Found in the stomach insects. Shot in a burying-ground adjoining the town : only one seen.

Alauda — ? Var. Albino, of a species we sent in the first box. No other lark except the *Alauda penicillata* has been seen this winter.

Parus cæruleus, Linn. Procured February 17. Bill black, with

brownish white margins; legs and claws bluish gray. Total length 4·5 inches. Several noticed in the same places as (*Parus major*, Linn.) from February 17 to April 7. Some were seen at Tortoom in February.

**Parus major*, Linn. Procured March 25. Bill black, with dark margins; legs and claws bluish gray. Total length, 5·5 inches. Among trees and rose-bushes in town. Noticed from January 31 to March 2.

**Emberiza Cia*, Linn. Procured April 4. Found in the stomach very small graminaceous seeds. Total length 6·8 inches. Bill bluish; legs light brown. Observed from 3rd to 25th of April, near mill-streams and in burying-grounds. Common.

Emberiza citrinella, Linn. Procured March 24. Food the same as that of *Emberiza Cia*. Common upon trees and in burying-grounds. Seen from March 23 to April 23. Total length 7 inches.

Emberiza hortulana, Linn. Procured April 19. Found in the stomach insects and small seeds. Total length 6·3 inches. Bill light brown; legs very pale light brown. Frequents the vicinity of mill-streams. Noticed from April 19 to May 8. It is singular, that among fourteen or fifteen birds which we examined, shot at different times and places, every one had insects as well as seeds in the crop and gizzard. The female has the feathers of the breast, summit of the head, nape, and sides of the chin, marked with longitudinal dusky spots.

Coccothraustes chloris, Flem.

Coccothraustes vulgaris, Briss. Procured April 10. Found in the stomach seeds, both large and small. On a tree in town. Only two seen.

Fringilla montifringilla, Linn. Procured March 31. Bill yellowish, and black at the tip; legs dusky. No others have been seen.

Fringilla Cælebs, Linn. Procured March 26 and 27. Found in the stomach small seeds. Common in the vicinity of rills. Total length 6·3 inches. Bill light brown, or of a smoke-blue colour; legs dark brown. Arrived March 26, departed April 17.

Pyrrhula —? Procured Feb. 27. Found in the stomach seeds. Total length 5·7 inches. Shot on some willows at Tortoom, where they are said to be common.

**Sturnus vulgaris*, Linn. Procured March 8. Total length 9·6 inches. Very common. Frequents the habitations of man, and feeds in fields, &c.; these birds are also the constant attendants of cattle while grazing: at sunset they return in large flocks, to roost upon trees and eaves of houses. Arrive in the beginning of March and disappear late in November. Turkish name, *Sighergik* (diminutive of ox).

Garrulus melanocephalus, Bonelli. Procured February 27. Bill black; legs light brown. Shot at Tortoom, thirty miles from Erzroom, having a much milder climate than this. Shy.

Pica caudata, Ray. Procured February. Found in the stomach carrion, insects, &c. A few live in and about town: roost and build on trees: none are found at Trebizond.

**Corvus monedula*, Linn. Found in the stomach carrion, offal, &c. Very common. Frequents town and the vicinity of man; often seen in fields, and is very familiar: in winter is only seen about the town: towards sunset these birds assemble in large flocks to roost upon the trees about the town: begin to pair early in April, and build in the end of the same month, low down in chimneys.

Corvus frugilegus, Linn. Killed March 24. Begins to arrive about the end of January. Common. Frequents fields, &c., and is often seen following the plough: towards sunset these birds assemble into small flocks, and return to town to roost upon trees, on which they build.

Corvus Cornix, Linn. Procured January 13. Found in the stomach grain, hair, bones, offal, &c. Arrives January 1 and leaves March 28. Common about the streams near town; when approached it sometimes erects the feathers on the crown of the head: it is by no means shy. Only seen on clear sunny days.

Cuculus canorus, Linn. Procured April 22 and 30. Found in the stomach insects. Iris yellow; margin of eyelids bright sulphur-yellow; tip of the bill and greater part of the middle black, remainder greenish; margins of the gape and the root of the lower mandible yellow; legs bright yellow: the plumage of both sexes alike. Noticed from April 22 to May 17. Frequents burying-grounds, fields, and the adjoining hills. Not numerous.

Yunx torquilla, Linn. Procured May 4. Found in the stomach very small brown ants. Shot on a tombstone. Solitary. Total length 7 inches.

Upupa Epops, Linn. Noticed from April 21 to September 17. Most common during summer.

Columba Aenas, Linn. Food seeds. Common.

Perdix saxatilis, Meyer. Numerous at Tortoom. Sometimes found here in the depth of winter, in burying-grounds and in the ditches round the town: in summer it is said these birds inhabit the neighbouring mountains.

Glareola limbata, Rüpp. Procured May 5. Found in the stomach small crickets. Total length 11 inches. Bill black, the margins of the gape being red; legs dusky, with black claws. Only seen in May, when these birds were common in small flocks about the moist turf near the river. Shy.

Nycticorax Europaeus, Steph. Procured March 29. Shot at the river, perched on a tree. Total length 24 inches. Iris bright scarlet.

Gallinula chloropus, Lath. Procured April 14. Found in the stomach very small black seeds. Anterior half of the bill yellow, with a greenish tinge; the remainder, as also the plate on the forehead, bright red, inclining to scarlet; iris bright red, with two very narrow rings round the pupil, the inner one being dark yellow and the outer one black; legs yellowish green, with a patch of bright orange red above the knee-joint. Fell with a few others into the yard of a house, where it was caught alive.

Totanus hypoleucus, Temm. Procured April 6 in a burying-

ground, near a pool of water. Another shot on the 19th, near a mill-stream.

**Scolopax major*, Gmel. Procured April 19. Total length 11·5 inches. Common in boggy grounds.

Charadrius minor, Meyer. Procured in March. Found in the stomach insects. Only three seen.

Platalea leucorodia, Linn. Procured May 24. Found in the stomach grass and feathers. Seen at the river, where it breeds: several nests are placed near each other, about the middle of the river. They are made of reeds, bound together by weeds, which are piled up a few inches above the water's edge. Over this foundation dried reeds are placed in various directions, to form the body of the nest, which is not lined with anything, and is just large enough to allow one bird to sit, and the other to stand beside it: we found four eggs in each; they are white, spotted with brown. Turkish name, *Cashik Booroonoo* (Spoon-bill), and *Taktar Boornoo* (Broad-bill).

Zapornia pusilla, Steph. Procured April 19. Bill green, with the margins of the gape red. Boggy ground near the river. Another shot May 5.

**Anas Boschas*, Linn. Procured May 12. Very common at the river: breeds here. The ducklings seen on the 1st of August 1838; these birds arrived on the 5th of April. Early in spring a few were seen in the fields near town; they afterwards feed in wet fields near the river.

Dafila caudacuta, Leach. Procured April 1. Found in the stomach small seeds. Shot in a brook near the river. Total length 26 inches. Upper mandible bluish, with slate-coloured sides near its base, and black culmen; under mandible brownish black; legs slaty colour, with the webs and claws dusky.

Chauliodes strepera, G. R. Gray. *Chauliodes strepera*, Sw. Procured March 28. Found in the stomach sand. In a wet field near mill-streams, close to town. Iris hazel. Drake, total length 19 $\frac{5}{8}$ inches. Maxilla black; mandibula dark brown; legs yellow, with very dark brown webs and claws. Duck, total length 18 $\frac{5}{8}$ inches. Bill yellow, with a very dark brown ridge along the middle of the maxilla; legs like those of the drake.

Rhynchosais clypeata, Steph. Procured April 21. Crop filled with worms, caterpillars, and a number of eggs of some insect or fish; gizzard contained small seeds and gravel. Total length 18·5 inches. Feet orange, with dusky webs and claws; maxilla of a dusky greenish tinge; mandibula dirty orange brown. A few of these birds seen together at the marsh.

**Querquedula circia*, Steph. Procured April 15. Total length 15·5 inches. Iris hazel; bill dusky; legs dusky gray; claws and webs dusky. A couple seen in a wet field near town.

**Podiceps cristatus*, Lath. Procured May 24. Found in the stomach grass, fish, and feathers. Iris bright cochineal colour, with a narrow yellow ring round the margin of the pupil; bill greyish dusky; legs outside dusky, inside yellowish gray, marked with patches of dusky. The bill in some (especially the males) has a good

deal of red. The plumage of both sexes is alike. Frequents the river.

Podiceps rubricollis, Lath. Procured May 24. Found in the stomach grass. At the river.

Podiceps auritus, Lath. Procured June 2. Found in the stomach grass, with a few insects. Iris of a very bright golden scarlet; margin of the eyelids orange; bill black; legs dusky outside, grayish inside. Inhabits the river.

Larus argentatus? Brunn. Procured April 12. Found in the stomach hair, clots of blood, chick peas, and a portion of a sheep's hoof. Iris hazel; margin of eyelids bright orange red; bill orange, marked with red, dusky near its tips, which have a horny appearance; legs yellowish orange, the claws dusky. Arrives March 23. At first frequents rills, at a short distance from the town, but after the melting of the snow these birds are found at the river. They are shy, and fly high.

**Larus ridibundus*, Linn. Procured April 20. Found in the stomach water-beetles. Iris hazel; bill of a deep lake-colour, with the tip inclining to dusky; margins of the eyelids bright red; legs same colour as bill; the claws dusky. Total length 14·5 inches. These birds are very common about the river, where they breed, on small strips of land, just appearing above water, and surrounded by sedges: the nests are placed in a row, mingled with those of other birds, and are constructed of reeds externally, and weeds inside; each nest is three or four inches high, and contained on the first of June one egg, of an olive-green colour, spotted irregularly with chocolate brown, and purple patches.

Sterna nigra, Linn. Procured May 24. Found in the stomach beetles. Iris very dark brown, almost approaching to black. Common at the river, where these birds are seen in small companies.

**Sterna Hirundo*, Linn. Procured May 24. Found in the stomach fish. Iris hazel. Frequents the river: common. Breeds on the slips of land that are laid bare by the diminishing of the waters at the river: it makes no nest, but lays its eggs on the ground.

Mr. Waterhouse exhibited skulls of the various genera contained in the order *Carnivora*, and stated that he had laid them before the Meeting for the purpose of pointing out certain characters, both in the crania and dentition, which might serve to distinguish the subdivisions of that order.

Judging from the form of the skull and lower jaw, and from the structure of the teeth, the order *Carnivora* (Mr. Waterhouse observed) appears to consist of six families, of which the Dog, Viverra, Cat, Weasel, Bear, and Seal afford familiar examples; of these the Cats and Weasels appear to be the most truly carnivorous, and the Bears the least so.

To these six families Mr. Waterhouse applies the names *Canidæ*, *Viverridæ*, *Felidæ*, *Mustelidæ*, *Ursidæ*, and *Phocidæ*.

In the first of these families (the *Canidæ*) the muzzle is elongated;

the bony palate terminates in a line with the hinder margin of the posterior molars, or even in advance of that line, and in this respect differs from other *Carnivora*; the posterior portion of the skull is short, and there are two true molars on either side, both of the upper and lower jaw.

The principal genera contained in this family are *Canis*, *Fennecus*, *Lycaon*, and *Megalotis*. In the form of the lower jaw, and in dentition, the last-mentioned genus affords a most remarkable exception to the other *Carnivora*, and the palate terminates behind the line of the posterior molars; there may be some doubt therefore as to its real situation.

The *Viverridae* have the same general form of skull as the *Canidae*, but differ in having the posterior portion more produced; the bony palate is carried further back, and the small back molar observable in the lower jaw of the Dogs is here wanting; they have, therefore, but one true molar on either side of the lower jaw, and two true molars on each side of the upper jaw.

To this family belong the genera *Paradoxurus*, *Cynogale* (which is the *Potamophilus* of Müller and *Limictis* of De Blainville), *Ambliodon*, *Hemigaleus*, *Herpestes*, *Cynictis*, *Ryzæna*, *Crossarchus* (the three last being divisions or subgenera of *Herpestes*, in which there is a complete bony orbit), *Viverra*, *Genetta*, *Prionodon*, and *Cryptoprocta*.

The Hyæna, Mr. Waterhouse stated, he was inclined to regard as an aberrant form of the *Viverridae*: in the general characters of the cranium, and especially in the curved form of the lower jaw, it differs considerably from the Cats (with which it has by some been associated), and approaches the Viverras. If, however, it be placed with the *Viverridae*, it will form an exception, as regards its dentition, having but one true molar on either side of the upper jaw. The 'carnassière' has a large inner lobe, and in this respect also resembles the *Viverras*, and not the Cats.

The species of the family *Felidæ* may at once be distinguished by the short rounded form of the skull, combined with the straightness of the lower margin of the ramus of the lower jaw, and the reduced number of the teeth, especially of the true molars, of which there are none in the lower jaw, and but one in the upper, and that very small.

This family contains the genus *Felis*, species of which are found in all quarters of the globe, Australia excepted. The Cats appear to bear the same relation to the *Mustelidæ* as the Dogs to the *Viverridae*.

The *Mustelidæ*, like the *Felidæ*, have the muzzle short and obtuse; the skull, however, is more elongated. They may be distinguished by there being one true molar on either side of each jaw; that in the upper jaw is well-developed, and generally transverse; but in some, such as the Badger, it is longer than broad: in the Otters, Skunks, and American Badger (*Taxidia Labradorica*), the true molar is intermediate in form between the common Badger (*Meles rul-*

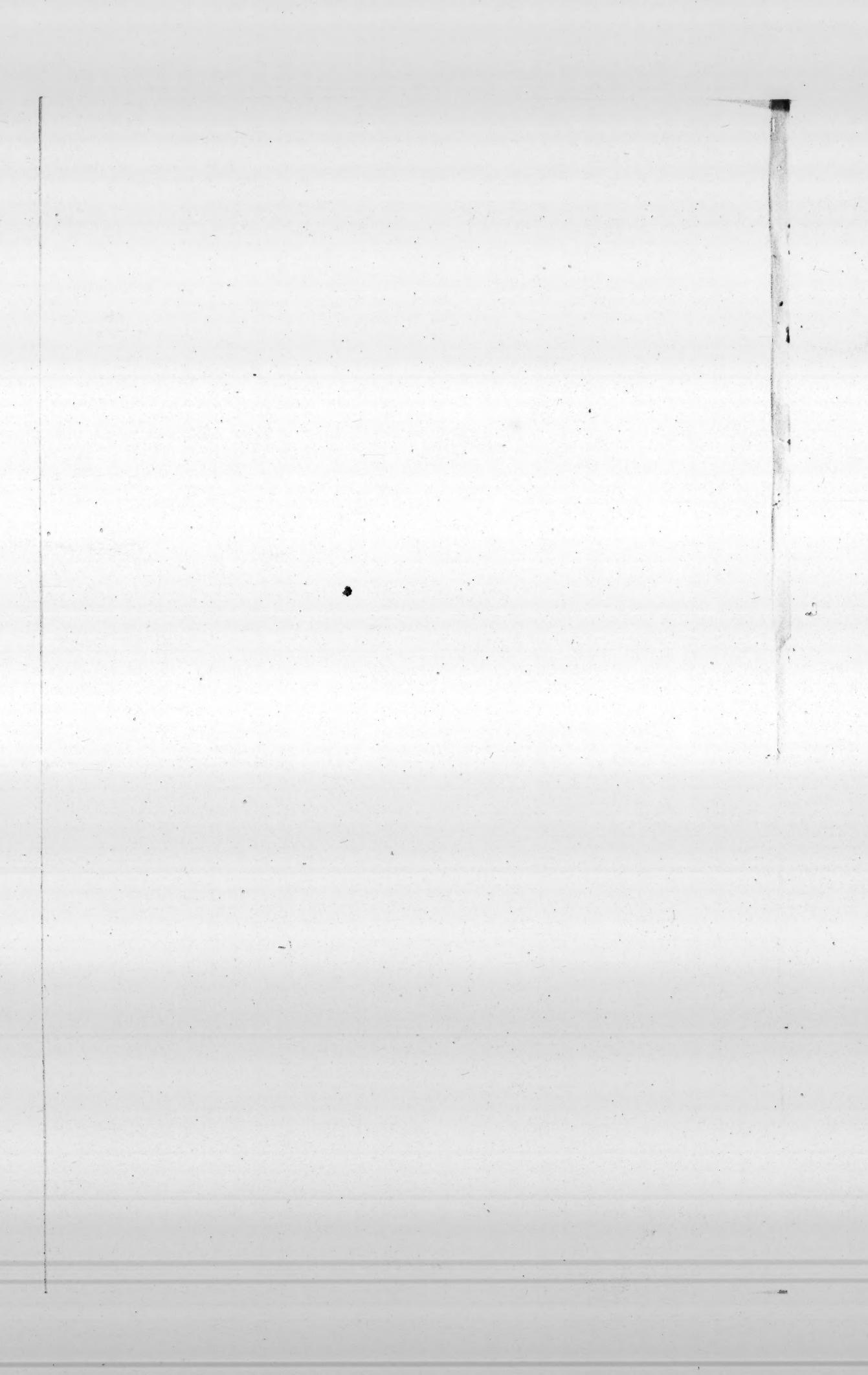
garis) and the more typical *Mustelidae*. The false molars in the Weasels (*Mustela*) are typically $\frac{3-3}{4-4}$, but in some species they are reduced to $\frac{1-1}{3-3}$. As in the *Felidae*, the angle of the lower jaw, in the greater portion of the *Mustelidae*, is on the same plane as the lower edge of the horizontal ramus: in other *Carnivora* it is raised. In this family there is a great tendency in the glenoid cavity of the temporal bone to enclose the condyle of the lower jaw. The condyle is more truly cylindrical, and longer than in other *Carnivora*. In the Dogs there is no trace of the anterior descending process of the temporal bone, which in the Mustelas confines the condyle of the lower jaw; in other *Carnivora* there is always a slight trace of this process, but in none does it enclose the condyles, as in most of the *Mustelidae*.

The genera contained in this family are *Mustela*, *Zorilla*, *Galictis*, Bell (which must not be confounded with the *Galictis* of Is. Geoffroy St. Hilaire, published in the 'Comptes Rendus' for October 1837, p. 581.), *Mellivora*, *Ursitaxus*, *Helictis* and *Gulo*, in which the true molar of the upper jaw is transverse; *Lutra* and *Mephitis*, in which this tooth approaches more or less to a square form; *Taxidea*, in which it is triangular; and lastly, *Meles*, *Arctonyx* and *Mydaus*, in which the true molar is longer than broad. This last-mentioned genus evinces an approach to the order *Insectivora*.

In the *Ursidae* there are two well-developed true molars on either side of each jaw: the 'carnassière' here has changed its function, not being suited, as in other *Carnivora*, to cutting flesh. The palate is considerably elongated. In the Bears (*Ursus* and its subgenera) it is small, being robbed as it were of its nutriment by the true molars, which are very large. In the other *Ursidae* (*Procyon*, *Nasua*, *Cercopetes*, *Arctictis* and *Ailurus*,) the 'carnassière,' especially that of the upper jaw, and the true molars, are nearly equal in size, and also nearly resemble each other in other respects†.

In the true Bears the form of the lower jaw differs from that of any of the preceding *Carnivora* in having a projecting process on the under side of the ramus, and situated a little in advance of the angle of the jaw. The same character is also found in many Seals (*Phocidae*), which in several other respects appear to approach the Bears.

† "From an examination of the external characters of *Bassaris astuta*, it appears to me that it belongs to this group."



October 8, 1839.

The Rev. F. W. Hope in the Chair.

The following letter, addressed to the Chairman of the Scientific Committee by John Gould, Esq., Corresponding Member, was read ; it is dated Van Diemen's Land, May 10th, 1839 :—

“ Although my present occupations will not permit me to send a lengthened communication, still, as a Corresponding Member of the Zoological Society, I am desirous of contributing to the pages of its proceedings ; I therefore forward herewith the characters of some new species of birds, together with a very slight summary of my peregrinations since leaving England, trusting to lay before you at some future period a more full account of the results of my labours. The greater number of the birds from which the following characters are taken are from the collection made by the officers of Her Majesty's ship the Beagle. To Captain Wickham and the other officers of that vessel I am indebted for much kindness and attention. By the exertions of Mr. Bynoe, surgeon of the Beagle, science has been enriched, not only by the discovery of these new species of birds, but of several others, and some quadrupeds of a most interesting description, the whole of which have been placed in my hands for the purpose of describing, figuring, &c.

“ It is now twelve months since I left England. The early part of the passage was boisterous and adverse, our ship being detained eleven days in the Bay of Biscay, during which period numbers of land-birds, all of European species, constantly visited the vessel ; but as no great interest attaches itself to their chance occurrence, I shall confine my observations more particularly to those species that make the expansive ocean their home, and whose natural limits have been but slightly recorded. The members of the genus *Thalassidroma* were the birds to which my especial attention was directed, from the circumstance of the group being but slightly understood, and from the great interest these little tenants of the ocean excite in the mind of the voyager. Immediately off the Land's End, Wilson's Storm-Petrel (*Thalassidroma Wilsoni*) was seen in abundance, and continued to accompany the ship throughout the Bay. The little Storm-Petrel (*Thalassidroma pelagica*, Selby) was also seen, but in far less numbers : both species disappeared on approaching the latitude of Madeira, their place there being occupied by another species, which I took to be *Thal. Bulweri*. This latitude was also favourable to the Shearwaters, *Puffinus cinereus*, and *Puff. obscurus*, the former being there in great numbers.

“ We came to anchor in the roadstead of Santa Cruz, Island of Teneriffe, on the 11th of June. During our short stay at this island, Nos. LXXXII. & LXXXIII.—PROCEEDINGS OF THE ZOOL. SOCIETY.

I proceeded as far into the interior as circumstances would permit, and spent a part of two days most delightfully. Among the birds I observed during my rambles were the Common Blackbird (*Merula vulgaris*, Ray), the Robin (*Erythaca rubecula*, Swains.), and the Black-cap Warbler (*Currucà atricapilla*, Bechst.)—a more southern locality, I believe, than has been hitherto recorded against these species. The fishes of this island also claimed a portion of my attention, several species of which I procured and preserved.

"We crossed the equator on the 7th of July, having been more than twenty days within the tropics, part of which time our vessel lay becalmed. This portion of the ocean's surface was also inhabited by Storm-Petrels, but of a distinct species from any I had hitherto observed, and which I believe to be new to science. These birds, with now and then a solitary *Rhynchos* and Frigate Bird (*Tachypetes*), were all of the feathered race that I observed in these heated latitudes, a part of the voyage which always hangs heavily upon those destined to visit these distant regions; by me, however, it was not so much felt, the monotony being relieved by the occasional occurrence of a whale, whose huge body rolled lazily by; by a shoal of porpoises, who sometimes perform most amusing evolutions, throwing themselves completely out of the water, or gliding through it with astonishing velocity; or by the occasional flight of the beautiful Flying Fish, when endeavouring to escape from the impetuous rush of the Bonito or Albacore.

"On the 20th of July we reached the 26th degree of south latitude, and were visited for the first time by the Cape-Petrel (*Procellaria Capensis* of authors). On the 23rd, lat. $31^{\circ} 10'$ S., long. 24° W., we found ourselves in seas literally teeming with the feathered race. Independently of an abundance of Cape-Petrels, two other species and three kinds of Albatrosses were observed around us. The latter were *Diomedea exulans*, *D. chlororhyncha*, and *D. fuliginosa*. A few days after this we commenced running down our longitude, and from this time until we reached the shores of Van Diemen's Land, several species of this family (*Procellariidae*) were daily in company with the ship. Whenever a favourable opportunity offered, Captain McKellar obligingly allowed me the use of a boat, and by this means enabled me to collect nearly all the species of this interesting family that we fell in with.

"As I had every reason to expect, I found the Australian seas inhabited by their own peculiar Storm-Petrels (*Thalassidroma*), four distinct species of which I have already observed since leaving the Cape.

"From the westerly winds which prevail in the southern hemisphere, between the latitudes 35° and 55° , I am induced to believe that a perpetual migration is carried on by several of the members of this oceanic family continually passing from west to east, and circumnavigating this portion of the globe. This remark more particularly refers to the Albatrosses, Prions, and other large kinds of Petrels; the same individuals of several of these species having been observed to follow our ship for some thousands of miles. Until I

had ascertained that they were nocturnal, it was a matter of surprise to me how the birds which were seen around the vessel at nightfall were to be observed crossing our wake at daybreak on the following morning, the ship having frequently run a distance of nearly 100 miles during the night.

"In conclusion, I may observe, that whatever success I have met with on the ocean, or whatever pleasures I may have enjoyed during the voyage, the country to which we were safely conveyed by our frail bark (now lying a wreck on the Trowbridge Shoal, Spencer's Gulf) has still greater treasures.

"During the eight months spent in these regions, six have been devoted to Van Diemen's Land and the islands in Bass's Straits, where I have made extensive and most interesting collections. Independently of the skins of birds and quadrupeds, skeletons of all the forms, together with entire bodies for dissection, have been procured, as also the nests and eggs of nearly seventy species of birds from Van Diemen's Land alone. The short visit I have paid to the continent of Australia has convinced me that much of interest there remains buried in obscurity, and that I shall there find much to occupy my attention when I fairly commence my researches in that country. The drought this season has been most distressing to the colonists. The Liverpool range was the furthest journey I made into the interior. While there I procured several specimens of the *Menura superba*; three of these I have entire for Mr. Owen to dissect; I have also the skeletons of two others, besides skins, &c. The only remark I shall now offer respecting this truly interesting bird is, that it has no relationship whatever to the *Gallinaceæ*, as has hitherto been considered.

"My assistant is now at Swan River, and I start for South Australia tomorrow; after which I proceed to Sydney; thence into the interior. I intend going to Moreton Bay and New Zealand before my return, and if I can accomplish, it to Port Essington and other parts of the north.

"I am happy to add, that in the execution of my researches the governors of the different colonies lend me their aid most willingly; and I shall ever be proud publicly to acknowledge the unremitting kindness of Sir John Franklin, whose goodness of heart is only equalled by his zealous attention to the duties of his high official station."

Mr. Gould's descriptions of the new Australian birds referred to in the letter were next read.

CYPSELUS AUSTRALIS. *Cyp. gutture et uropygio albis; corpore supernè et subtùs intènse fusco; dorso metallicè splendente; plumis pectoris abdominisque albo marginatis; alis caudáque nigris; rostro, oculis, et pedibus nigris.*

Long. tot. $6\frac{1}{2}$ poll.; rostri, $\frac{3}{4}$; alæ, $7\frac{1}{4}$; caudæ, $3\frac{1}{2}$; tarsi, $\frac{7}{16}$.

This species is about the size of *Cypselus murarius*: I first met with it on the 8th of March, 1839. They were in considerable abundance, but flying very high. I succeeded in killing one, which

was imminently pronounced by Mr. Coxen and others to be new to the colony. On the 22nd I again saw a number of these birds hawking over a piece of cleared land at Yarrondi, on the Upper Hunter: upon this occasion I obtained six specimens, but have not met with it since.

PODARGUS PHALÆNOÏDES. *Pod. cinereo, fuscoque ornatus, lineâ nigrâ centrali per plumas singulas excurrente; scapularibus, tectricibusque majoribus castaneo sparsis; primariis fuscis, albo angustè fasciatâ; caudâ cuneiformi, nigro angustè fasciatâ; rostro fuseescenti-corneo; pedibus olivaceis.*

Long. tot. $14\frac{3}{4}$ poll.; rostri, $2\frac{1}{4}$; alæ, $8\frac{1}{2}$; caudæ, $6\frac{1}{2}$; tarsi, 1.

Hab. The north-west coast of Australia.

This bird is smaller than any other species of the genus yet discovered in Australia.

From Benjamin Bynoe, Esq.

GRAUCALUS PHASIANELLUS. *Grauc. cinereus; uropygio abdomineque albis, angustè nigro-fasciatâ; crasso albo; alis caudâque nigris, hâc ad basin albâ; rostro tarsisque nigris.*

Long. tot. 15 poll.; rostri, $1\frac{1}{4}$; alæ, $8\frac{1}{2}$; caudæ, 8; tarsi, $1\frac{1}{2}$.

Hab. Liverpool Plains.

From the collection of Stephen Coxen, Esq.

PACHYCEPHALA LANIOÏDES. *Pach. vertice, plumis auricularibus et pectore nigris; dorso posteriore fasciâ castaneâ ornato; gutture, abdomine medio, crisoque albis; dorso, lateribus, humeris, necnon primariis secundariis tectricibusque, externâ, cinereis; caudâ, rostro, pedibusque nigris.*

Long. tot. $7\frac{1}{2}$ poll.; rostri, 1; alæ, $3\frac{3}{4}$; caudæ, $3\frac{1}{4}$; tarsi, 1.

Hab. The north-west coast of Australia.

From Benjamin Bynoe, Esq.

PETROICA ROSEA. *Pet. (mas) vertice, gulâ, corporeque supernâ cinereis; fronte fasciâ angustâ albâ notato; pectore rosaceo; abdomen, crisoque, albis; alis, rectricibusque caudæ sex intermediis nigrescentibus; rectricibus externis ad apicem albis; rostro, pedibusque nigrescentibus.*

Fœm., fasciâ frontali luteâ; corpore suprà cinereo-fusco; alis, fasciis, secundariis fasciis duabus luteis, obscurè notatis; caudâ fusca.

Long. tot. $4\frac{1}{2}$; rostri, $\frac{1}{2}$; alæ, $2\frac{3}{4}$; caudæ, $2\frac{1}{4}$; tarsi, $\frac{1}{2}$.

Hab. Hunter, and the Liverpool Range.

This species is nearly allied to *Petroica Lathami*. It inhabits thick brushes. I killed specimens both on the Hunter River and the Liverpool Range.

PETROICA PULCHELLA. *Pet. nigra, fronte notâque humerali albis; pectore abdomineque coccineis; rostro nigro; pedibus fuscis.*

Long. tot. 5 poll.; rostri, $\frac{3}{4}$; alæ, $\frac{3}{4}$; caudæ, $2\frac{1}{8}$; tarsi, 1.

Hab. Norfolk Island.

MALURUS CRUENTATUS. *Mal.* (mas) dorso, humerisque coccineis; partibus reliquis nigris.

Fœm., pallidè fusca, abdomine albescente; rostro, tarsisque pallidè fuscis.

Long. tot. 4 poll.; rostri, $\frac{1}{2}$; alæ, $1\frac{5}{8}$; caudæ, $1\frac{3}{4}$; tarsi, $\frac{3}{4}$.

Hab. North-west coast of Australia.

PARDALOTUS UROPYGIALIS. *Pard.* vertice et linea oculari nigris; linea superciliari, pectore, et abdomine medio, albis; gulâ, genisque croceis; uropygio sulphureo; dorso cinerescenti-olivaceo; alis nigris, primariis plurimis ad basin albo notatis; alâ supra ad apicem coccineâ; caudâ nigrâ, plumis externis tribus ad apicem albis; rostro nigro; tarsis plumbeis.

Long. tot. $3\frac{1}{2}$ poll.; rostri, $\frac{1}{2}$; alæ, $2\frac{1}{4}$; caudæ, 1; tarsi, $\frac{3}{4}$.

Hab. North-west coast of Australia.

From Benjamin Bynoe, Esq.

AMADINA ANNULOSA. *Am.* facie gulâque albis, vittâ nigrâ marginatis; pectore albescente, subtus fasciâ nigrâ marginato; vertice dorsoque cinerescenti-fuscis, lineis albidis transversis, angustè notatis; uropygio, crasso, caudâque nigris; alis fuscis; tectricibus, secundariisque cinereo crebrè ornatis; rostro pedibusque plumbeis.

Long. tot. 4 poll.; rostri, $\frac{3}{8}$; alæ, 2; caudæ, $2\frac{1}{8}$; tarsi, $\frac{1}{2}$.

Hab. North-west coast of Australia.

This species is nearly allied to *Estrilda Bichenovii*.

From Benjamin Bynoe, Esq.

AMADINA ACUTICAUDA. *Am.* vertice genisque cinereis; corpore cervino; abdomine rosco lavato; loris, gulâ, fasciâ per uropygium currente, caudâque, nigris; tectricibus caudæ, crasso, et femoribus, albis; rostro pedibusque flavis.

Long. tot. $5\frac{3}{4}$ poll.; rostri, $\frac{3}{8}$; alæ, $2\frac{3}{8}$; caudæ, $3\frac{3}{4}$; tarsi, $\frac{5}{8}$.

Hab. North-west coast of Australia.

This species has the two central tail-feathers very long and tapering.

From Benjamin Bynoe, Esq.

DASYORNIS STRIATUS. *Das.* fuscus; abdomine cinerescente; plumis dorsalibus linea centrali albâ notatis; rostro pedibusque nigercentibus.

Long. tot. $6\frac{1}{2}$ poll.; rostri, $\frac{5}{8}$; alæ, $2\frac{3}{8}$; caudæ, $3\frac{1}{2}$; tarsi, 1.

Hab. Liverpool Plains, New South Wales.

This species is nearly allied to the *Amytis textilis* of Lesson.

MYZANTHA FLAVIGULA. *Myz.* spatio pone oculos, fronte, gulâque flavis; uropygio albo; dorso cinereo, obscurè albo fasciato; loris, plumisque auricularibus, nigris; gulâ, genis, corporeque subtus, albis, pectore notis fuscis in formâ sagittæ ornato; alis caudâque fuscis; primariis externè, caudâque ad basin fla-

vescentibus ; caudā ad apicem albā ; rostro flavo : pedibus flavescenti-fuscis.

Long. tot. $9\frac{3}{4}$ poll.; rostri, 1; alae, $5\frac{1}{4}$; caudae, 5; tarsi, $1\frac{3}{5}$.

Hab. Banks of the Namoi, interior of New South Wales.

This species is rather larger than *Myzantha garrula*, to which, and *M. citreola*, it is closely allied.

MYZANTHA LUTEA. *M. cute nudā pone oculos, fronte, apicibus que plumarum ad latera colli, citreis; loris nigro-fuscis; plumis auricularibus nigrescentibus splendore argenteis; corpore suprà cinereo, nuchā dorsoque albo transversim fasciatis; uropygio, tectricibus caudae, et corpore subtūs, albis; gulā, pectoreque cinereo lavatis, plumis singulis notā fuscā fasciatis; alis fuscis plumis obscurè citreo marginatis; caudā fuscā ad apicem albā; rostro citreo; pedibus flavescenti-fuscis.*

Long. tot. $10\frac{3}{4}$ poll.; alae, $5\frac{1}{8}$; caudae, $5\frac{1}{4}$; tarsi, $1\frac{1}{4}$.

Hab. North-west coast of Australia.

From Benjamin Bynoe, Esq.

TROPIDORHYNCHUS ARGENTICEPS. *Trop. vertice argenteo, capitis partibus reliquis nudis, et nigrescentibus; corpore subtūs albo; pectoris plumis lanceolatis; corpore suprà caudāque fuscis; rostro pedibusque nigrescenti-fuscis.*

Long. tot. $10\frac{1}{2}$ poll.; rostri, $1\frac{3}{8}$; alae, $5\frac{1}{2}$; caudae, $4\frac{1}{2}$; tarsi, $1\frac{1}{8}$.

Hab. North-west coast of Australia.

From Benjamin Bynoe, Esq.

POMATORHINUS RUBECULUS. *Pom. gulā, strigāque superciliari albis: pectore, et abdomine superiore rufescenti-fuscis; strigā a rostro, per oculos, ad occiput tendente nigrescenti-fuscā; vertice, dorso, abdomineque imo intensē fuscis, olivaceo-tinctis; tectricibus caudae, crasso caudāque nigris, hāc ad apicem albā, rostro corneo; pedibus nigrescentibus.*

Long. tot. $9\frac{1}{4}$ poll.; rostri, $1\frac{1}{8}$; alae, 4; caudae, $4\frac{3}{8}$; tarsi, $1\frac{1}{4}$.

Hab. North-west coast of Australia.

From Benjamin Bynoe, Esq.

PTILOTIS FLAVESCENS. *Pt. olivaceo-cinerea, capite corporeque subtūs citreis; notā ad latera capitidis fuscā, et pone hanc alterā nitidē flava.*

Long. tot. $4\frac{1}{2}$ poll.; rostri, $\frac{3}{4}$; alae, $2\frac{7}{8}$; caudae, $2\frac{1}{2}$; tarsi, $\frac{3}{4}$.

Hab. North-west coast of Australia.

From Benjamin Bynoe, Esq.

MYZOMELA ERYTHROCEPHALA. *Myz. intensē fusca, capite, et uropygio, coccineis; rostro pedibusque nigris.*

Long. tot. $4\frac{1}{2}$ poll.; rostri, $\frac{3}{4}$; alae, $2\frac{1}{4}$; caudae, $1\frac{3}{4}$; tarsi, $\frac{5}{8}$.

Hab. North-west coast of Australia.

From Benjamin Bynoe, Esq.

SITTELLA LEUCOPTERA. *Sitt. vertice, plumis auricularibus, nec non alis, caudāque nigris, hāc ad apicem albā, illis fasciis trans-*

versa alba ornatis; gulâ, tectricibus caudæ, corporeque subtus albis; dorso, cinerescenti-fusco, plumis ad medium fusco notatis; rostro ad basin pallide flavo, ad apicem nigro, pedibus flavis.

Long. tot. 4 poll.; rostri, $\frac{1}{6}$; alæ, 3; caudæ, $1\frac{1}{2}$; tarsi, $\frac{1}{6}$.

Hab. North-west coast of Australia.

From Benjamin Bynoe, Esq.

HEMPODIUS CASTANOTUS. *Hem. capite, et pectore olivaceo-cinereis, plumis colore cervino notatis, illius ad apicem, hujus apud medium; abdomine medio crisoque stramineis; strigâ superciliari, caudâ, dorso et humeris, castaneis, dorsi, humororumque plumis albo guttatis, singulis guttis anticè nigro marginatis; primariis fuscis, cervino colore marginatis; rostro pedibusque pallidè flavis.*

Long. tot. 7 poll.; rostri, $\frac{1}{6}$; alæ, $3\frac{1}{2}$; tarsi, 1.

Hab. North-west coast of Australia.

From Benjamin Bynoe, Esq.

Mr. Yarrell exhibited a small but perfect specimen of the Eagle Ray, *Myliobatis aquila* of British fishes, which had been found on the shore of Berwick Bay, and was sent to him from thence by Dr. George Johnston.

"Particular interest attaches to this very rare specimen," observed Mr. Yarrell, "since it establishes the fact that this fish is a native species; the only evidence which previously existed of the Eagle Ray being a British fish was founded on some parts of a specimen, believed to belong to this species, which were procured from a fisherman of Scarborough by Mr. Travis, a surgeon in that place."

A fresh specimen of the Angler-fish (*Lophius piscatorius*), presented by John Goldham, Esq., was also exhibited.

October 22, 1839.

James Whishaw, Esq., in the Chair.

A letter from R. J. Bourchier, Esq., Corr. Memb. Z.S., dated Malta, October 2nd, 1839, was read. It stated that Mr. Bourchier had shipped two cases of preserved specimens of Natural History, a box containing some living Gundies (*Ctenodactylus Massoni*), and an Eagle, for the Society; the Eagle from Sir Thomas Reade, Hon. Memb. Z.S., H. M. Consul-General at Tunis, and the remaining specimen from Col. Warrington, Corr. Memb. Z.S., H. M. Consul-General at Tripoli.

A letter from the Society's Corresponding Member, R. Mackay, Esq., H. M. Consul-General at Maracaibo, was also read. It is dated Maracaibo, July 12, 1839, and refers to an insect presented by the writer to the Society, in the body of which a kind of plant had taken root.

Mr. Waterhouse observed, "that the insect in question was apparently the larva of one of the *Lamellicornes*, and that on one side of the body, springing partly from the thoracic segments, and partly from the foremost segments of the abdomen, were about six sprouts of some vegetable, probably of the genus *Clavaria*. The longest of these sprouts is about one inch in length; they are cylindrical, bent in an irregular manner, have no branches, and for the most part are joined together near and at the root. He also observed that numerous similar instances of insects having this kind of vegetable production attached to different parts of the body were on record: he might refer to the well-known instance of the caterpillar found in New Zealand, an account of which is published in the Transactions of the Entomological Society*, where will also be found references to several other cases.

"That the dead body of animals constituted a substance fitted to nourish a vegetable is not extraordinary; but in the letter from Mr. Mackay it is stated that the insect was alive when first found; and this is by no means a solitary instance in which these vegetable productions have made their appearance on living insects. These facts, combined with others, which tend to show that to a slight degree there is an independent existence in the different parts of the same insect,—where life is retained for a considerable time in parts, although they may be separated,—are highly interesting in a physiological point of view."

Dr. Horsfield communicated to the Meeting a "list of Mammalia

* Vol. II. Part 1, Journal of the Proceedings, p. vi.

and Birds collected in Assam by John McClelland, Esq., Assistant-Surgeon in the service of the East India Company, Bengal Establishment, Member of the late Deputation which was sent into that country for the purpose of investigating the nature of the Tea Plant."

"On the return of the Deputation above-mentioned to Calcutta," says Dr. Horsfield, "Mr. McClelland delivered his collection of Mammalia and Birds, accompanied by a descriptive catalogue and drawings of many subjects, to the Bengal Government, to be forwarded to the Court of Directors. These subjects arrived safely in England, and are now, with few exceptions, prepared and exhibited in the Company's Museum at the India House.

"In his official correspondence with the Bengal Government, Mr. McClelland explains the object he principally had in view in making the collection in the following terms: 'Having been invited to offer any suggestion I may have to submit, as to how this portion of my labour may be disposed of with most advantage, I shall, in venturing an opinion, keep in view the objects with which my collections were made: these were, to procure as much information as Upper Assam is calculated to afford, in elucidation of the circumstances under which the Tea Plant is found in that country.'

"Next to the relations of the plant in regard to soils, and its association with other vegetable productions, the *zoology* of the province is entitled to careful examination; so that all its productions may be compared with those of the tea districts of China.

"The accompanying catalogue of animals will be found to display an interesting balance numerically in favour of the extension of species from the eastward, a point that ought to be carefully examined, as bearing upon the main question; for in proportion as the Tea Plant is associated in Assam with the prevalence of Chinese forms, the prospect of its successful cultivation becomes the more certain." —*Extract from Mr. McClelland's letter to the Secretary of the Bengal Government.*

"Mr. McClelland then expresses his desire that his Descriptive Catalogue, before publication, should be revised in England, in order to prevent the introduction of mere nominal species, and to conform the nomenclature to the latest discoveries in science. In accordance with this desire, the entire collection has been carefully compared with subjects from India contained in the British Museum and in the Museums of the Zoological Society and the East India Company, as well as with the drawings and descriptions lately published in various zoological works to which Mr. McClelland had no access.

"The following catalogue now exhibits Mr. McClelland's collection, with those alterations which the progress of discoveries required, and with a partial modification of the arrangement; and in performing this task the only object has been to secure to Mr. McClelland the discoveries he has made, and to bring before the public a faithful statement of his zoological observations in Assam, and of the zeal and ability with which he has executed the charge confided to him."

MAMMALIA.

Order I. QUADRUMANA.

Genus HYLOBATES, Illig.

1. *Hylobates Hoolook*, Harlan, Trans. Amer. Philos. Soc.

The first authentic account of this animal is contained in the fourth volume of the Transactions of the American Philosophical Society. Dr. Harlan here describes and figures, from a prepared specimen, an adult male, which was brought to Philadelphia in 1832 by Dr. M. Burrough, together with a large collection of rare and valuable skins of quadrupeds and birds, obtained on the plains of the Burhampooter river, near Assam. The specimen described, with another adult and a young subject, was presented to Dr. B. by Capt. Alex. Davidson, of the Hon. East India Company's station at Goalpura, in the latitude of 26° north on the Burhampooter. They were taken on the Garrow Hills, in the vicinity of that station; they soon became tamed, especially the young one; they were docile and affectionate, and rather inclined to melancholy. They lived some time in the possession of Dr. B., but died on his voyage down the river to Rangoon.

A specimen of this species was brought from India by General Hardwicke, and presented to the museum of the Zoological Society, where it is exhibited. Living individuals are at present in the Society's Gardens in the Regent's Park.

"The colour of the Assam animal is uniformly black, except the eye-brows, which are white. Some individuals are grayish-yellow. Its length is not much above two feet. It is possessed of the most wonderful activity, making use of its arms in swinging from tree to tree: nor is the female in any way restrained in her movements by the young, which she carries suspended to her body."

"Inhabits the Cossiah Mountains and valley of Assam."—*McClelland's MS.*

Genus MACACUS, *La Cép.*2. *MACACUS ASSAMENSIS**. *Fulvo-cinereus, suprà saturatior, gastræo artuumque latere interiore canis; capillitio pilis paucis nigris sparso; facie natibusque carneis; caudâ partem tertiam longitudinis totius superante omnino pilis tectâ.*

"Bluish-gray, with dark brownish on the shoulders; beneath light gray: face flesh-coloured, but interspersed with a few black hairs: length 2½ feet: proportions strong: canine teeth long, and deeply grooved in front; the last of the cheek-teeth in the upper jaw blunt."—*McClelland's MS.*

Order II. CHEIROPTERA.

Genus PTEROPUS, Briss., &c.

3. *PTEROPUS ASSAMENSIS*. *Capite anticè toto ex saturato rufes-*

* The names used in this paper, where no authority is given, are those of Mr. McClelland's MS.

cente fusco, posticè zonā pallidiore in aureum vergente cincto; collo omni, nuchā, interscapulio, pectore abdomineque e xeram-pelino aureis, plagā laterali saturatiore; vellere in his elongato sublanuginoso; notæo e saturato fusco-nigricante pilis albis com-misto; patagio nigro; auriculis elongatis acuminatis; axillis humerisque lanagine fusco vestitis.

The face and the whole anterior part of the head are deep chestnut-brown, with a slight tendency to tawny; the back part of the head is surrounded by a belt of a lighter tint, inclining to orange, which also includes the throat. Around the entire neck, to the origin of the membrane, is a broad collar of rusty-yellow, inclining to orange, diversified with deeper rufous shades; the same colour, with its variation of tints, embraces the interscapulum, and extends to the breast and anterior part of the abdomen; the lower portion of the abdomen and the vent are rufous-brown. The back is deep blackish-brown, with a scanty admixture of white hairs; the fur, though slightly appressed, is more soft and silky than in the other species belonging to this section of *Pteropus*. The membrane is blackish. The flanks, armpits, and the bones of the shoulders and arms, are covered with a soft, silky, lengthened down, of a rufous-brown colour. The ears are long and pointed. The entire length is eight inches.

This species, although it resembles the *Pt. edulis* and *Edwardsii* (or *medius*) in habit, distribution of tint, and in the form of the ears, is nevertheless distinguished from them by the character of the fur on the neck, breast, and adjoining parts. This is not short and rigid, as in the species mentioned, but long, soft, and silky, furnished at the base with a close down, of a dark colour: in this particular it approaches to the second section of this genus, which is characterized by a lengthened, silky, frizzled fur, and of which the *Pteropus dasymallus*, Temm., is the type. The toes and claws are proportionably large.

There are in Mr. McClelland's collection two specimens of this species, for which he has proposed the specific name of *Assamensis*: this, notwithstanding the objection raised to local names, has been retained, in order to direct naturalists in India to the country where it was discovered, and thus to determine, by future search, its rank as a distinct species, and also the existence of other species of both groups, typified by *Pteropus edulis* and *Pteropus dasymallus*.

Genus VESPERTILIO, Auct.

4. *Vespertilio* — ?

A single specimen of *Vespertilio* has been received, which is not sufficiently perfect to determine its true character.

Order III. FERÆ.

Genus URSUS, Linn., &c.

No opportunity was afforded to determine the species of *Ursus* found in Assam.

Genus MANGUSTA, Oliv.

5. *Mangusta auropunctata*, Hodgs. Journ. Asiat. Soc. V. 1836, p. 235.

Genus FELIS, Linn., &c.

6. *Felis Tigris*, Linn.

"There are other species of this genus, but their characters I have not had an opportunity of examining."—*McClelland's MS.*

Order V. PACHYDERMATA.

Genus ELEPHAS, Linn.

7. *Elephas Indicus*, Linn.

Genus SUS, Linn.

8. *Sus Scropha*, Linn.

"The size the wild boar attains in Assam may be conceived, from one of the sculls of the animal in my collection, containing a tusk which measures in length twelve inches."—*McClelland's MS.*

Genus RHINOCEROS, Linn.

9. *Rhinoceros Indicus*, Cuv.

Order VI. RUMINANTIA.

Genus CERVUS, Linn.

10. *Cervus porcinus*, Zimmerm.

"The *Cervus porcinus* is not a rare animal, as has been supposed; I have seen it in the Tarrai, at the foot of the Kemaon mountains, as well as in Assam, where it is the commonest species of the genus. I had in my collection a curious instance of an albino of this species, for which I was indebted to Mr. Hugon of Assam. It was a female, every part of it white; but it was shot and prepared before I had an opportunity of examining the irides. It is an interesting proof that the change of colour in the fur of animals is not dependent on the cold of northern latitudes."—*McClelland's MS.*

11. *Cervus Pumilio*, Hamilt. Smith, Griff. Anim. Kingd. V. No. 788.

"A small portion of the scull of this animal has been procured by me.

"There are other large species of *Cervus* in Assam, and several smaller kinds, but which I have not been able to procure."—*McClelland's MS.*

Order VII. RODENTIA.

Genus SCIURUS, Linn., &c.

12. *Sciurus bicolor*, Auctor. *Sciurus giganteus*, McClelland's MS.

"Upper part of the head, the nose, the ears, outer and hinder portion of the fore-legs, the feet, tail, and back, deep glossy-black; beneath yellowish-white; two small spots on the chin; cheeks white; a rudimental thumb, covered by a flat nail. Body fifteen, tail sixteen inches long.

"The above description has been derived from seven or eight specimens procured during the course of three months. Among the various individuals I have seen there appeared to be no difference.

"It differs from the *Sciurus maximus* by the absence of the marrone colour on the head, and from *Sciurus Leschenaultii* by its greater size, its deep black colour above, without any diminished intensity of shade on the anterior part of the head and nose; and from *Sciurus bicolor* of Sparmann by the uniform blackness of the upper parts of the body, extending to the extremity of the tail, which is entirely black."—*McClelland's MS.*

Individuals of this species, agreeing in all particulars with those collected in Assam by Mr. McClelland, have been observed in other parts of India by Dr. Francis (Buchanan) Hamilton and by Dr. Finlayson. The latter forwarded several specimens to the Museum at the India House. The specific character originally constructed by Sparrmann, and subsequently adopted by all systematic writers, defines accurately the animal as described by Dr. Hamilton and by Mr. McClelland. Schreber's figure also agrees with the same, while the animal from Java (represented in Horsfield's Zoolog. Res.), and indicated as a variety in Fisher's 'Synopsis Mammalium,' appears to differ from the continental species by the variations to which its tint is subject. It remains therefore for further research and observation to determine, whether these two varieties may not be specifically distinct, and whether the name proposed by Mr. McClelland should not henceforth be applied to the species observed in Continental India by himself and by Hamilton and Finlayson.

13. *Sciurus hippurus*, Isid. Geoff. Guerin. Mag. Zool., Pl. VI.

"Gray above, on the cheeks, on the outside of the limbs, and base of the tail: feet grayish-black: throat and lower part of the body reddish-brown: posterior third of the tail reddish-brown in a single specimen procured by Mr. Griffith in the Cossia mountains, but black in five specimens procured by myself in Upper Assam: tail as long as the body. Entire length of the animal eighteen to twenty inches. Inhabits the Cossia mountains, as well as the eastern parts of Assam."—*McClelland's MS.*

14. *Sciurus Lokriah*, Hodg., Journ. Asiatic. Soc., Bengal, V. 1836. p. 232.

"Above brown, sprinkled with yellow, the hairs being dark at their bases, but towards their extremities alternately barred with fulvous. A broad irregular yellowish stripe extends from the chin to the tail, and is broadest on the throat. Ears rounded, and nearly naked: tail nearly equal to the body in length: body eight inches long, and of stout proportions."—*McClelland's MS.*

One imperfect specimen sent by Mr. McClelland agrees precisely with Mr. Hodgson's description, referred to above.

15. *Sciurus Lokrioides*, Hodg., Journ. Asiatic Soc., Bengal, V. p. 232.

"Light gray, with a yellow tinge on the sides of the thorax; silver-gray beneath; hairs above alternately barred with light and dark gray. Tail scarcely so long as the body: ears short, but pointed upwards: length eight inches."—*McClelland's MS.*

16. *SCIURUS McCLELLANDII*, Horsfield. *Suprà fuscus fulvo tenuissimè irroratus noto eo saturatiore; subtùs ex sordido fulvo canescens; dorso summo lineâ rectâ atrâ; lineâ insupèr utrinque laterali fuscâ lœlo fulvo marginatâ, anticè saturatiore, ad oculo s extensâ, posticè obsoletâ in uropygio utrinsecus approximatâ; caudâ mediiori subcylindrico-attenuatâ nigro fulvoque variegatâ; auriculis atris barba niveâ lanuginosâ insigni circumscriptis; vibrissis longis nigris.*

A black line extends along the spine, with a double-shaded line of yellow and brown on each side, softly relieved from the remaining upper portion of the body (which is most minutely variegated fulvous and brown); yellowish-gray beneath: tail slightly tapering, shorter than the body and legs, more bulky than in Squirrels in general: length three and a half inches, exclusive of the head, which measures one inch.

"It inhabits Bengal as well as Assam, and is the only one of the foregoing species possessed of pencilated tufts on the ears. They have each long black beards."—*McClelland's MS.*

Genus LEPUS, Linn.

17. *Lepus timidus*, Linn.

"This Hare is found in Assam, but its size is degenerate, measuring only from seventeen to nineteen inches in length. It is not esteemed as an article of food. The ears are more uniformly gray than in the European variety."—*McClelland's MS.*

18. *Lepus hispidus*, Pearson.

This species is admitted by Mr. McClelland, on the authority of J. T. Pearson, Esq., late Cur. Mus. As. Soc., who described it in the Calcutta Sporting Magazine.

"Its hair is harsh and bristly; ears very short, not projecting beyond the fur: length eighteen inches: colour more dusky-gray than that of the Hare. Inhabits Assam, especially the northern parts of the valley along the base of the Boutan mountains.

"I am indebted to Lieutenant Vetch of Assam for the skin of this animal, but unfortunately the scull is wanting; but according to Mr. Pearson it is the same as the scull of the common Hare."—*McClelland's MS.*

Order VIII. EDENTATA.

Genus MANIS, Linn.

19. *Manis brachyura*, Erxl.

"This animal has fifteen rows of scales, extending longitudinally over the body; those on the back are longest, and are rounded posteriorly, but they are narrow below, and carinose; while on the back they are simply striated at the base. Bristly hairs pass out between the scales.

"Lower parts of the head, the throat, and a line extending along the lower portion of the body to the tail, and the inner sides of the legs, without scales, but covered with a scanty coarse white hair."—*McClelland's MS.*

AVES.

Order I. RAPTORES.

Fam. FALCONIDÆ. Sub-Fam. AQUILINÆ.

Genus HALIAËTUS, Sav.

1. *Hal. Macei*. *Falco Macei*, Temm. Pl. Col. Pl. 8.

"A Fisher Eagle. Throat and nape yellowish-white, covered with long pointed feathers; crown and base of the neck grayish-yellow (feathers of the latter obtusely pointed), all other parts of the bird brown, except a broad band across the tail, which is white. The tarsi are naked two-thirds of their length: wings long, extending nearly to the extremity of the tail: length thirty-three inches.

"This eagle preys on fish, and is particularly active during a storm, when it is found soaring over the lee-shore, descending on such fishes as are driven into shallow water. During fine weather it spends the principal portion of its time on some high solitary bank, quite motionless."—*McClelland's MS.*

2. *Hal. Pondicerianus*. *Aquila Ponticeriana*, Briss. Pl. enlum. 416. *Falco Pondicerianus*, Gmel. Linn. I. 265. Lath. Ind. Orn. I. p. 23.

Genus SPIZAËTUS, Vieill.

3. SPIZ. RUFITINCTUS. *Suprà fuscus capite saturatiore, notæo nebulis dilutioribus vario; caudâ fusco et cinerescente latè fasciatâ; subtùs albo fuscoque varius, collo pectoreque rittatis, ab domine femoribusque fasciatis; tarsi ultra medium plumosi.*

"Upper part of the body dark brown, with slight undulations of a deeper tint: breast and throat longitudinally striped with brown: belly and under surface of the wings white, transversely barred with brown: tarsi feathered to the lower third, each feather marked with five transverse bars: tarsi shielded: the beak short, much hooked, and sharp: claws and toes strong and formidable.

"It inhabits the banks of the Burhampooter and other rivers in Assam, where it conceals itself in bushes and grass, along the verge of the water, seizing such fishes as approach the surface within its reach."—*McClelland's MS.*

Sub-Fam. FALCONINÆ.

Genus FALCO, Linn, &c.

4. **FALCO INTERSTINCTUS.** *Suprà laetè ferrugineus nigro fasciatus; subtus dilutior subflavescens; pectore abdomineque nigro vittatis; capite nigro lineato; rectricibus pogonii singulis nigro fasciatis, fasciâ caudali terminali latiore ferrugineo marginata; remigibus nigricantibus margine fasciisque interioribus ferrugineis.*

"Brown striated Falcon. Upper part of the body and wing-coverts brown, with blackish bars across the feathers, but on the head the stripes are longitudinal; quill-feathers blackish; inner margin barred with pale ferruginous; tail-feathers transversely barred with black; below paler, inclining to dusky-yellow, except the breast and sides, which are marked with longitudinal brown spots. Entire length fourteen inches."—*McClelland's MS.*

The bird here described, to which Mr. McClelland has given the specific name of *interstinctus*, agrees in many points with the female of *F. Tinnunculus*; but from the observations hitherto made, it would appear that it is entitled to distinction by the fact that the sexes have not the same difference in markings and external character which belongs to the European and Asiatic Kestrils. The researches made by Col. Sykes in the Dukhun confirm the determination of Mr. McClelland. Col. S. mentions, in the Catalogue of Birds from Dukhun, "his being in possession of a male bird exactly like the female Kestrel in plumage and size, and consequently larger than the male Kestrel; and as this was shot from a party of five or six perched on the same tree, and without a male Kestrel in company, he is induced to believe that there is a distinct species, in which both sexes have the plumage of the female European Kestrel."

The museum of the East India Company has received specimens from Madras agreeing accurately with those collected by Mr. McClelland, but further observations are required to determine whether Mr. McClelland's bird deserves to be ranked as a distinct species.

Sub-Fam. BUTEONINÆ.

Genus CIRCUS, Auct.

5. *Circ. melanoleucus.* *Falco melanoleucus*, Gmel. Linn. I. 274. Black and White Indian Falcon, Penn. Ind. Zool., Pl. 2. Engl. Ed.

"This bird is a fisher, like the *Brown Spizaëtus* above described; but instead of inhabiting the banks of rivers, it is found in low inundated places, where it feeds, with Waders, on Reptiles and Mollusca, as well as on Fishes."—*McClelland's MS.*

Sub-Fam. MILVINA.

Genus MILVUS, Auct.

6. *Milvus Govinda*, Sykes?

"The primary quill-feathers are blackish-brown at their tips; every other part of their plumage is brown. It is a common Kite in Assam, as in every other part of India."—*McClelland's MS.*

Note.—A single specimen of this bird, not well preserved, was found in the collection: some uncertainty respecting the species to which it really belongs still remains.

Fam. STRIGIDÆ. Sub-Fam. NOCTUINA.

Genus ATHENE, Boie: NOCTUA, Sav.

7. *Athene cuniculoides*. *Noctua cuniculoides*, Gould's Cent. Himal. Birds, Tab. IV.

Sub-Fam. BUBONINA.

Genus SCOPS, Sav.

8. *Scops Lempiji*. *Strix Lempiji*, Horsf. Trans. Linn. Soc. XIII. p. 140.

Order II. INSESSORES, Vigors.

Tribus FISSIROSTRES, Cuv.

Fam. MEROPIDÆ.

Genus NYCTIORNIS, Swains. Zool. Illust. II. Pl. 56.

9. *Nyctiornis Athertonii*.

"Toes much longer than the tarsi; outer ones united to the last joint, and the inner to the first joint: beak compressed, arched equally from the forehead, and terminating in a point formed by both mandibles: nostrils concealed with feathers: body seven, tail five inches long."—*McClelland's MS.*

Fam. HIRUNDINIDÆ.

Genus HIRUNDO, Auct.

10. *Hirundo brevirostris*. *Suprà nigricans nitore olivaceo; subtùs fuscescens, alis elongatis; caudâ mediori subsurcatâ; rostro brevissimo.*

This species agrees with *Hirundo fuciphaga* in habit, in proportional length of wing, and shortness of beak, and in colour above; but it is darker underneath, and more than one third larger: entire length six inches.

11. *Hirundo Jewan*, Sykes, Proceed. Zool. Soc. 1832, p. 83.

The specimens of this bird sent from Assam by Mr. McClelland agree in all points with those discovered in Dukhun by Col. Sykes.

12. *Hirundo brevicaudata.* *Suprà fusca; subtùs cana; uropygio albido; caudá brevissimâ subæquali.*

This species has the general physiognomy of the *Hir. concolor*, Sykes, but it is considerably smaller, of a lighter tint, and without the white spots on the tail which mark that species.

Fam. **TODIDÆ.**

Genus **EURYLAIMUS**, Horsf.

13. *Eurylaimus lunatus*, Gould, Trans. Zool. Soc. of London, I. 175.

The specimens forwarded by Mr. McClelland from Assam agree with those preserved in the Museum of the Zoological Society, which have been examined and marked by Mr. Gould.

14. *Eurylaimus Dalhousiae*, Jamieson, Edin. New Phil. Journ., vol. 18, p. 389. *Psarisomus Dalhousiae*, Swainson, Cab. Cyclop. Birds, Vol. II. 261. Royle's Illustr., Part VI. Pl. 7.

Eurylaimus Psittacinus, Tem. Pl. Col. 598.

Eurylaimus (Crossodera) Dalhousiae, Gould, 'Icones Avium,' Part I. Aug. 1837.

"Above grass-green, beneath light bluish-green; throat yellow; crown velvet-black, with blue and yellow spots; quills black on their inner margins, but anteriorly light blue in the middle of the wings; tail slender, light blue above, beneath black; length nine inches."—*McClelland's MS.*

Fam. **HALCYONIDÆ.**

Genus **ALCEDO**, Linn.

15. *Alcedo Bengalensis*, Gmel. Linn. I. 450. Little Ind. Kingfisher, Edw.

16. *Alcedo rufa*, Linn. I. 181. Black and White Kingfisher, Edw.

Genus **HALCYON**, Swains.

17. *Halcyon Smyrnensis*. *Alcedo Smyrnensis*, Linn. I. 181.

18. *Halcyon leucocephala*, Gmel. Linn. I. 456.

Tribus **DENTIROSTRES**, Cuv.

Fam. **MUSCICAPIDÆ.**

Genus **PHÆNICORNIS**, Sw.

19. *Phœnicornis princeps*. *Muscipeta princeps*, Gould's Cent. of Himal. Birds, Pl. VII.

20. *Phœnicornis brevirostris*. *Muscipeta brevirostris*, Gould's Cent., Pl. VIII. The male.

21. *PHÆNICORNIS ELEGANS*. *Capite elongato, sincipite admodum*

compresso; capite, collo, dorso summo, alis, rectricibusque duabus mediis nigris; corpore subtus, dorso imo, fascia lata alarum, maculis paucis apud remiges secundarios, rectricibusque lateribus aurantio-coccineis.

The character given by Mr. Gould of the *Phœnicornis (Muscipeta) princeps*, as far as regards the nature and distribution of its colours, applies also to the *Ph. elegans*, but the latter is somewhat less in size, while it is chiefly distinguished by the flatness of the crown, which brings it nearly on a plane with the upper mandible. Mr. McClelland has given on one sheet a comparative view of the *Phœn. elegans, princeps, and brevirostris*, in order to illustrate the form of the head in each species, and the depression of the sinciput in *Phœn. elegans*, in which its essential difference consists.

22. *PHœNICORNIS AFFINIS.* *Capite colloque supra cum regione interscapulari griseis; collo subtus gastrœo, dorso imo, maculis tribus alarum, rectricibus interioribus ad basin exterioribus totis flavis: alis caudâque in medio nigris.*

"The male is larger than the female, and distinguished from her by a yellow band on the forehead between the eyes."—*McClelland's MS.*

Mr. Gould has figured this bird as the female of *Phœn. brevirostris*, but by annexing a mark of interrogation to the specific character, has indicated his doubt respecting the correctness of his determination, or its being really a distinct species. This doubt has now been explained by the researches of Mr. McClelland in its native country.

Genus MUSCICAPA, Auct.

23. *Muscicapa melanops*, Vigors, Proceed. Zool. Soc. 1831, 171; Gould's Cent. of Himal. Birds, Pl. VI.

24. *MUSCICAPA? CAPITALIS.* *Capite supra tectricibus primariis, rectricibusque supra atris; macula suboculari utrinque ad occiput producta albâ; subtus, dorso lateribusque colli saturatè fuscis; crissô et uropygio canis.*

The distinctive character of this species rests on a very concise description of Mr. McClelland, accompanied by a drawing: no perfect specimen was found in the collection. Length five inches.

Genus RHIPIDURA, Vigors & Horsf.

25. *Rhipidura fuscoventris*, Frankl., Proceed. Zool. Soc. 1831, 117, Broad-tailed Fly-catcher, Lath.?

Genus CRYPTOLOPHA, Swains. Nat. Lib. Ornith. Vol. X., Fly-catchers.

26. *Cryptolopha pojoccephala*, Sw., loc. cit. p. 200. Pl. XXIII. *Platyrhynchus Ceylonensis*, Swains. Zool. Illust., I. 13.

Fam. LANIADÆ, Vigors.

Genus ARTAMUS, Vieill.

27. *Artamus leucorhynchos*, Vieill. *Lanius leucorhynchos*, Linn.
Mantis. (1771) p. 524.

Genus DICRURUS, Vieill.

28. *Dicrurus grandis*. *Edolius grandis*, Gould, Proceed. Zool. Soc. 1836, p. 5.

Several specimens of this bird received from Assam agree with the specific character and description given by Mr. Gould (as above cited) in all points excepting the size, being about one-third smaller; but further observations are required to determine with precision the points by which the long-tailed *Edoli* are to be discriminated.

29. *Dicrurus Rangoonensis*. *Edolius Rangoonensis*, Gould, Proceed. Zool. Soc. 1836, p. 5.

One of our specimens agrees accurately with Mr. Gould's specific character; in two others the crest is less developed, and the lanceolated plumes on the throat are less prominent.

30. *Dicrurus Balicassius*, Vieill, Enc. Meth. Ornith., 751. *Corvus Balicassius*, Linn. Syst. I. p. 155. *Le Drongo Balicasse*.

31. *Dicrurus æneus*, Vieill, Enc. Meth. Ornith., 751. *Le Drongo Bronzé*.

Genus TRICHOPHORUS. Temm.

32. *Trichophorus flaveolus*, Gould, Proceed. Zool. Soc. 1836, p. 6.

"Yellowish-green above, with a tinge of brown on the wings and tail; beneath bright yellow: crested with narrow feathers, becoming progressively longer from the nostrils to the crown; bill strong, compressed, and slightly hooked; cheeks and nucha scantily covered with feathers. Eight inches long."—*McClelland's MS.*

The specimens sent from Assam agree with those contained in the Museum of the Zool. Society from the Himalaya, which are the originals of Gould's description.

Genus COLLURIO, Vigors.

33. *Collurio nigriceps*, Frankl., Proceed. Zool. Soc. 1831, p. 117. Indian Shrike, Lath.

"Crown, nape, tail, and wings black; throat and breast white; body and secondaries reddish-gray. Length nine inches."—*McClelland's MS.*

34. *Collurio erythronotus*, Vigors, Proceed. Zool. Soc. 1831, p. 42. Gould's Century of Himal. Birds, Pl. XII. fig. 2.

"This species, as found in Assam, compared with the figure in Gould's Century of Himalayan Birds, is considerably smaller, and

the colours more dull in the Assam than in the Himalayan bird. I am therefore disposed to think that the species has here reached its south-eastern geographical limit, as the *Irena puella* may be supposed in Assam to have reached its northern limit."—*McClelland's MS.*

Genus HYPsipetes, Vigors, Proceed. Zool. Soc. 1830-1, p. 43.

35. **HYPsipetes McCLELLANDII**, Horsf. *Suprà olivaceo-viridis; capite subcristato vinaceo-fusco, plumis albicante strigatis; subtùs vinacea, abdomine pallidiore; gulá albida, plumis laxis lanceolatis; rostro flavicante.*

"Head brown; body and tail above yellowish-green; beneath vinaceous-gray, the tints of the abdomen being lighter. (Plumes of the throat white, lanceolate, and straggling, being bedded in a bluish down.) Inner vanes of the quills brownish-black; tarsi slender, and rather short. Length nine inches."—*McClelland's MS.*

36. *Hypsipetes psaroides*, Gould's Century of Himal. Birds, Pl. X.

37. **HYPsipetes GRACILIS**. *Suprà olivaceo-cinerea, criso pallidore; subtùs ex diluto cinnamomeo albicans; capite summo atro; remigibus primoribus atris, vexillis exterioribus tenuiter cano marginatis, secundariis canis margine nigro; rectricibus ex diluto olivaceo canescensibus, fasciâ latâ subterminali nigra in exterioribus gradatim latiore.*

This species deviates slightly from the character of *Hyps. psaroides*, the type which served for the definition of the genus, and gradually approaches that of *Kittacincla* of Gould.

Genus GRAUCALUS, Cuv.

38. **GRAUCALUS MACULOSUS**. *Cærulescenti-canus, alis caudâque saturatioribus obscuro olivaceo nitentibus; rectricibus exterioribus albo apiculatis.*

"Olive-black on the wings and tail; body above dark olive-gray, with light gray longitudinal streaks on the feathers under the throat, and light wavy lines on the abdomen and vent; outer tail-feathers with white tips. Length eight and a half inches."—*McClelland's MS.*

Fam. MERULIDÆ.

Genus IANTHOCINCLA, Gould, Proceed. Zool. Soc. 1835, p. 187.

39. **IANTHOCINCLA GULARIS**. *Capite suprà pectoreque cærulescenti cinereis; notæ, abdomine, femoribus, rectricibusque exterioribus læte cinnamomeis in aurantium vergentibus; dorso saturatore; rectricibus intermediis nigricantibus; strigâ aterrime a rostri basi sub oculos ad regionem paroticam productâ; guld tarisque flavicantibus; rostro nigro.*

"Head ash-gray, with a black band passing along the eyes; throat yellow; breast gray; rest of the body light olivaceous-brown, incli-

ning to reddish-yellow; beak compressed, arched above a little more than below, depressed at the point; tarsi strong, longer than the middle toe, and yellow; wings rather short and round."—McClelland's MS.

This bird, although greatly resembling the *Ianthocincla albogularis* of Gould, is clearly distinguished from that species by the yellow colour of its throat, by the absence of the white tips to the exterior tail-feathers, by its yellow tarsi, and by the brighter orange shade of its general tint.

40. *Ianthocincla pectoralis*, Gould, Proc. Zool. Soc. 1835, p. 186.

"Above greenish-brown, beneath yellow and white, irregularly intermixed. A black band extends over each eye, descending on the sides of the neck, unites (from each side) in front of the neck; throat yellowish-white; lower tail-feathers tipped with white; beak compressed, slightly arched above; upper mandible projecting and slightly depressed at the tip; tarsi high and strong."—McClelland's MS.

41. *IANTHOCINCLA LUNARIS*. *Cinnamomeo-olivacea, capite summo caudaque nigricantibus; fronte, gutture pectoreque in medio atris; lunula insigni collari a regione parotici gulam versus extensa crisoque late ferrugineis.*

"Dark olive; throat and lores black, bounded posteriorly by a light brown crescent; vent and a few clouds on the abdomen of the same colour; tail blackish; wings short, and chiefly concealed beneath the downy plumage of the back; tarsus strong, longer than the middle toe; beak arched beneath, compressed, slightly denticulated, but not hooked. Length nine inches."—McClelland's MS.

Genus ORIOLUS, Auct.

42. *Oriolus melanocephalus*, Gmel. Linn. I. 383. Black-headed Oriole, Lath.

43. *Oriolus Traillii. Pastor Traillii*, Gould's Cent. Himal. Birds, Pl. XXXV.

Genus IRENA, Horsf.

44. *Irena Puella*, Horsf., Linn. Trans., XIII. p. 153. *Coracias Puella*, Lath. Ind. Orn. 171.

Genus IXOS, Temm.

45. *IXOS MONTICOLA*. "Above grayish-brown; crown black and crested; throat and abdomen white; vent scarlet; lower tail-feathers tipped with white; wings short; body four inches, tail three inches long, and square; a scarlet ring about the eye, but no red tuft beneath this organ; by the latter circumstance it differs from *Ixos jocosus*.

"Inhabits the Kossia mountains, and usually seen in numerous flocks, flying from tree to tree in quest of insects. Their note is

shrill and inharmonious, not unlike that of the sparrow." — *McClelland's MS.*

Further observations are required to determine the rank of this bird as a distinct species, or as a variety of *Ixos jocosus*.

46. *Ixos Cafer*. *Turdus Cafer*, Linn. I. 295. *Le Curouge*, Le Vaill.

Genus **TIMALIA**, Horsf.

47. *Timalia pileata*, Horsf., Linn. Trans., XIII. p. 151.

" This is another instance of a species of the Malayan Archipelago having extended itself to Assam, and is more interesting from the smallness of its size, its length being only five and a half inches in Assam, but in Sumatra and Java it is six and a half inches in length. The tail in the Assam variety is marked with obscure bands, which does not appear to be the case with the Java variety; and the plumes of the belly and thighs are shorter in the former than in the latter." — *McClelland's MS.*

Genus **GEOCICHLA**, Kuhl.

48. *Geocichla Rubecula*, Gould, Proceed. Zool. Soc. 1836, p. 7.

Fam. **SYLVIADÆ**.

Genus **MOTACILLA**, Auct.

49. *Motacilla variegata*, Steph. Pied Wagtail, Lath. *Mot. pictata*, Frankl.

Genus **SAXICOLA**, Bechst.

50. *Saxicola Rubicola*, Temm.

51. **SAXICOLA?** OLIVEA. *Suprà olivaceo-viridis, subtùs ex plumbeo cærulescens; fronte flavicante.*

" A minute species, olive-green above, leaden-blue beneath, and olive-yellow on the forehead; anterior toes short; tarsi elevated. Length three inches." — *McClelland's MS.*

A single specimen only has been forwarded, which is not sufficiently perfect to determine its true generic character with certainty.

Genus **PHœNICURA**, Jard. & Selb.

52. *Phœnicura Reevesii*, Gray, Zool. Misc.

Genus **ZOSTEROPS**, Vigors and Horsf.

53. *Zosterops Maderaspatanus?* Catal. of Zool. Specim. Append. to Life of Sir T. S. Raffles, p. 661.

The specimen sent home by Mr. McClelland differs from that brought from Sumatra by Sir T. S. Raffles in being a trifle smaller.

Fam. PIPRIDÆ.

Genus PARUS, Linn.

54. *Parus atriceps*, Horsf., Trans. Linn. Soc., XIII. 160.

55. *Parus flavocristatus*, De Lafresnaye. *Mésange à huppe jaune*, Guerin, Mag. Zool., Pl. 80. Janvier 1837. *Parus Sultaneus*, Hodgson, India Review and Journal of Foreign Science, &c., by F. Corbyn, Esq., April 1837.

"The female is distinguished from the male by the black colour being less intense, and intermixed more with a greenish tint. For the first specimen of this elegant bird I was indebted to Mr. Griffith, who procured it during our descent from the Kossia mountains into Assam, in which place, however, they are more common."—*McClelland's MS.*

Genus LEIOTHRIX, Swains.

56. LEIOTHRIX LEPIDA. *Capite subcristato suprà nucháque cinereis in cærulescentem vergentibus; dorso tectricibusque alarum ex olivaceo cinnamomeis; alis caudáque suprà ex parte cæruleis; remigum pogoniis internis latè nigris, apicibus albis; rectricibus exterioribus pogoniis internis, omnibus apicibus albis: subtùs ex diluto cinnamomeo canescens.*

"Gray; bluish on the crown, brownish on the back, and light bluish-gray beneath; wings and tail blue (inclining to black), with minute white tips and light blue outer margins. Length five inches."—*McClelland's MS.*

57. LEIOTHRIX SIGNATA. *Olivaceo-fusca abdomine pallidiore; alis, caudáque subcastaneis; guld obsoletè flavicante; fasciâ collaris ex latè-cyaneo nitente.*

"Olive-brown above, lighter beneath; a Prussian-blue streak on each side of the neck; tail short and square. Length five inches."—*McClelland's MS.*

58. LEIOTHRIX ORNATA. *Capite colloque suprà nigricantibus; subtùs tænidique ad latera colli per oculos ad rostrum ductâ albis; notæ cinnamomeo, criso pallidiore; alis caudáque nigris, remigibus secundariis albo marginatis, primoribus rectricibusque ad apices albo limbatis, omnibus nitore cruento inductis.*

"Head black, with a white streak passing over each eye; back brown; wings and tail black, variegated with scarlet and white; beneath white."—*McClelland's MS.*

Tribus CONIOSTRES, Cuv.

Fam. FRINGILLIDÆ, Vigors.

Genus MIRAFRA, Horsf.

59. MIRAFRA ASSAMICA. *Corpoce cinereo-brunneo variegato, uropygio pallidiore; remigum pogoniis internis caudæque basi rufis;*

subtus ex rufescente cana, plumis pectoris nigro maculatis; lunula obsoletè fuscæ temporibus.

This species appears to be intermediate between *Mirafra Javanica*, Horsf., and *Mirafra phœnicura*, Frankl., but its characters are sufficiently marked to distinguish it from both.

60. **MIRAFRA FLAVICOLLIS.** *Suprà olivaceo-brunnea, vertice saturiore, tectricibus secundariis albicante marginatis; subtus flava, fasciis paucis obsoletè fuscis; criso caudâque subtus albicantibus.*

Length five inches.

Genus PLOCEUS, Cuv.

61. **Ploceus Manyar.** *Fringilla Manyar*, Horsf., Trans. Linn. Soc., XIII. p. 160.

Genus LONCHURA, Sykes, Proceed. Zool. Soc., 1832, p. 94.

62. **LONCHURA MELANOCEPHALA.** *Capite, collo, pectoreque atris; corpore, alis caudâque saturatè badiis.*

Length four inches.

63. **Lonchura Cheet**, Sykes, Proceed. Zool. Soc., 1832, p. 95.

Fam. STURNIDÆ.

Genus PASTOR, Temm.

64. **Pastor tristis**, Temm. *Gracula tristis*, Lath., Ind. Orn., I. 190.

65. **Pastor Pagodarum**, Temm. *Turdus Pagodarum*, Gmel. Linn.

Genus LAMPROTORNIS.

66. **Lamprotornis spilopterus**, Gould's Cent. of Himal. Birds.

Fam. CORVIDÆ.

Genus CORVUS, Linn.

"The Raven, the Carrion Crow, and the Rook, are inhabitants of Assam, but are seldom found in the depths of the forests. They rather follow the footsteps of man, and establish themselves in small numbers in the vicinity of villages and such places on the banks of rivers as are frequented by travellers as halting-places. The Hooded Crow is very common, but I did not perceive anything peculiar about it to induce me to add it to my collection."—McClelland's MS.

Genus DENDROCITTA, Gould, Proceed. Zool. Soc., 1833, p. 57.

67. **DENDROCITTA FRONTALIS.** *Facie aterrima, conterminio exactè circumscripto, alis caudâque nigris; occipite, vertice, collo, pectoreque albis, diluto canescente lavatis; humeris, notæ, hypochondriis, femoribusque badiis in ferrugineum vergentibus; tectricibus secundariis saturato cœrulecenti-canis.*

Length of the body seven, of the tail ten inches.

68. *Dendrocitta vagabunda*, Gould's Cent. Himal. Birds. *Pica vagabunda*, Vieill, Encyclop. Method. Ornitholog., p. 888. *Coracias vagabunda*, Lath., Ind., I. 171.

Genus KITTA,

69. *Kitta venatorius*, Gray, Illustrations of Indian Zoology, I. Pl. XXIV.

Genus CORACIAS, Linn.

70. **CORACIAS AFFINIS.** *Capite suprà æruginoso, nuchá dorsoque olivaceis, aeneo subnitentibus; fasciâ alarum latâ, tectricibus utrinque, rectricibus ad basin, salvis intermediis glaucis, saturatissimè cyaneis; fasciâ remigum primorum subterminali, secundariarum basali, uropygio, fasciâ latâ terminali rectricum, crisoque lâtè thalassinis: subtùs et lateribus colli vinaceis; guld plumis laxis, in medio violaceo-vittatis, ornata.*

Genus GRACULA.

71. *Gracula religiosa*, Linn. Syst., I. p. 164.

Fam. BUCERIDÆ.

Genus BUCEROS, Linn.

72. *Buceros Malabaricus*, Gmel. Linn., I. 359. Pied Horn-Bill, Lath.

73. *Buceros Homrâi*, Hodgson, Journ. As. Soc. Bengal, Vol. I. p. 251.

Mr. Hodgson's description of the *Buceros Homrâi* applies closely to Mr. McClelland's specimens, and also to the bird figured in the 44th plate of Gould's Century of Himalayan Birds, and to specimens from Sumatra in the East India Company's Museum; while the *Calao à casque concave* of Le Vaillant, according to Dr. Shaw's description and specific character, differs in various particulars.

Fam. LOXIADÆ, Vigors.

Genus PARADOXORNIS, Gould, Proceed. Zool. Soc., 1836, p. 17.

74. *Paradoxornis flavirostris*, Gould, loc. cit., figured in Gould's 'Icones Avium,' Part I. *Bathyrhynchus brevirostris*, McClelland, Quarterly Journal of the Calcutta Med. and Phys. Society, Dec. 1837. With a figure.

"Brown, beneath yellowish-brown; head brown, with a black circle under each eye, the interior feathers of which have white tips; wings short; beak much compressed, strong, shorter than its depth, and thrice the depth of its breadth at the base; mandibles equally arched, and meeting in front, without a hook, in an obtuse point; nostrils small, round, and concealed by recurved feathers."—McClelland's MS.

Tribus SCANSORES.

Fam. PSITTACIDÆ.

Genus PALÆORNIS, Vigors.

75. *Palæornis torquatus*, Vigors. *Psittacus torquatus*, Auct.

76. *Palæornis Pondicerianus*, Vigors. *Psittacus Pondicerianus*, Auct.

Fam. PICIDÆ.

Genus BUCCO, Auct.

77. *Bucco corvinus*, Temm. Pl. Col. DXXII.

78. *Bucco cyanops*, Cuv. *Capito cyanocollis*, Vieill. Gal. des Ois. XXXV.

Genus PICUS, Linn.

79. *Picus strenuus*, Gould.

80. *Picus occipitalis*, Gould's Cent. of Himal. Birds, Pl. XLVII.

81. *Picus Nepalensis*, Gray and Hardw. Ind. Zool., Pl. XXXI. Fig. 1.

82. *Picus Macei*, Temm. Pl. Col. LIX.

83. *Picus (Chrysonotus, Swainson) GRANTIA*. *Fronte, alis, caudique suprà ex sordide aurantio rufescentibus; collo suprà et ad latera ex viridi flavicante; subtùs fuscus; rectricibus flavicante fasciatis; remigibus primoribus fuscescentibus, vexillis alternis flavo-guttatis vel fasciatis.*

Length nine inches.

This bird belongs to Mr. Swainson's subgenus *Chrysonotus*, Lard. Cab. Cycl. Birds, II. p. 309, of which *Picus Tiga*, Linn. Tr., XIII. 177, is given as the type.

Genus YUNX, Linn.

84. *Yunx torquilla*, Linn.

The specimens collected by Mr. McClelland agree in all points with the bird as found in Europe.

Fam. CERTHIADÆ.

Genus SITTA, Linn.

85. *Sitta frontalis*, Horsf., Linn. Trans., Vol. XIII. p. 162.

Genus UPUPA, Linn.

86. *Upupa Epops*, Linn.

From comparison with European specimens, it appears that this bird, as occurring in Assam, can scarcely be considered a variety of the *U. Epops* of Linnæus; although Mr. McClelland's specimens

are rather smaller, they do not agree with the *U. minor* of Shaw, which is found in Africa.

Genus POMATORHINUS, Horsf.

87. *Pomatorhinus montanus*, Horsf., Linn. Trans., XIII. p. 165.

No essential difference is apparent between a specimen of this bird sent from Assam and the specimens obtained in the Island of Java, from which the original description was made.

Fam. CUCULIDÆ.

Genus PHœNICOPHAUS, Vieill.

88. *Phœnicophaeus tristis*, Lesson?

"Bottle-green above; dark greenish-gray beneath; throat light greenish-gray, with black streaks; naked space around the eyes; superciliary streak white; tail with white tip; beak green. Thirteen inches long."—*McClelland's MS.*

No specimen having been found of this species, it will require further observations to determine its true character.

Genus CENTROPUS, Ill.

89. *Centropus Philippensis*, Cuv.

"This species is very common in villages and cultivated rice-fields in Assam, and in low inundated lands along the banks of rivers. It is tame even in the most deserted places in which it is found, and seldom flies; but if pressed too closely, it rather forces its way into a thick hedge. It delights in moist humid climates, as is proved by the vast numbers of them which occur in the Sunderbunds, the only part of India except Assam in which I have seen them; but I believe they are also seen in the vicinity of Calcutta. I am informed that they are common at Maulmain on the Tenasserim coast, but I question if they are to be found in India further north-west than Bengal. They have a very peculiar suppressed note, resembling *whono*, uttered with such a degree of ventriloquism, that although you see the individual from which the sound escapes, you do not expect it as the cause. In passing through the Sunderbunds in April last, this *whono* was almost the only sound I heard, and I was at first induced to suppose that it proceeded from some concealed animal in my boat."—*McClelland's MS.*

90. *Centropus lepidus*, Horsf., Linn. Trans., XIII. p. 180.

Mr. McClelland's specimen is comparatively of a large size, but agrees in all particulars with the *Cent. lepidus* from Java.

Genus TROGON.

91. *Trogon Hodgsonii*, Gould, 'Monograph of Trogonidæ.'

Tribus TENUIROSTRES, Cuv.

Fam. CINNYRIDÆ.

Genus CINNYRIS, Cuv.

92. **CINNYRIS ASSAMENSIS.** *Cinn. nigrescens, capite suprà gulaque metallicè purpureis; dorso et colli lateribus intensè fuscensi-rubris; plumis ad partem dorsi posteriorem flavido terminatis; uropygio, tectricibus caudæ superioribus, rectricibusque caudæ duabus intermediis metallicè purpureis; his elongatis; abdome et criso flavido lavatis: rostro valde incurvo, et quā caput paululum longiore.*

This species is closely allied to *Cinnyris Gouldiae*.

93. **CINNYRIS LABECULA.** *Punicea; gula pectoreque nitidissimis; capite, plumis scapularibus, caudique metallicè aureo viridibus; alis fuscis viridi nitentibus; subtus cana.*

Body three inches, tail two inches long.

Genus ARACHNOTHERA, Temm.

94. *Arachnothera inornata*, Temm., Pl. Col. LXXXIV.

Fig. 2.

Fam. MELIPHAGIDÆ.

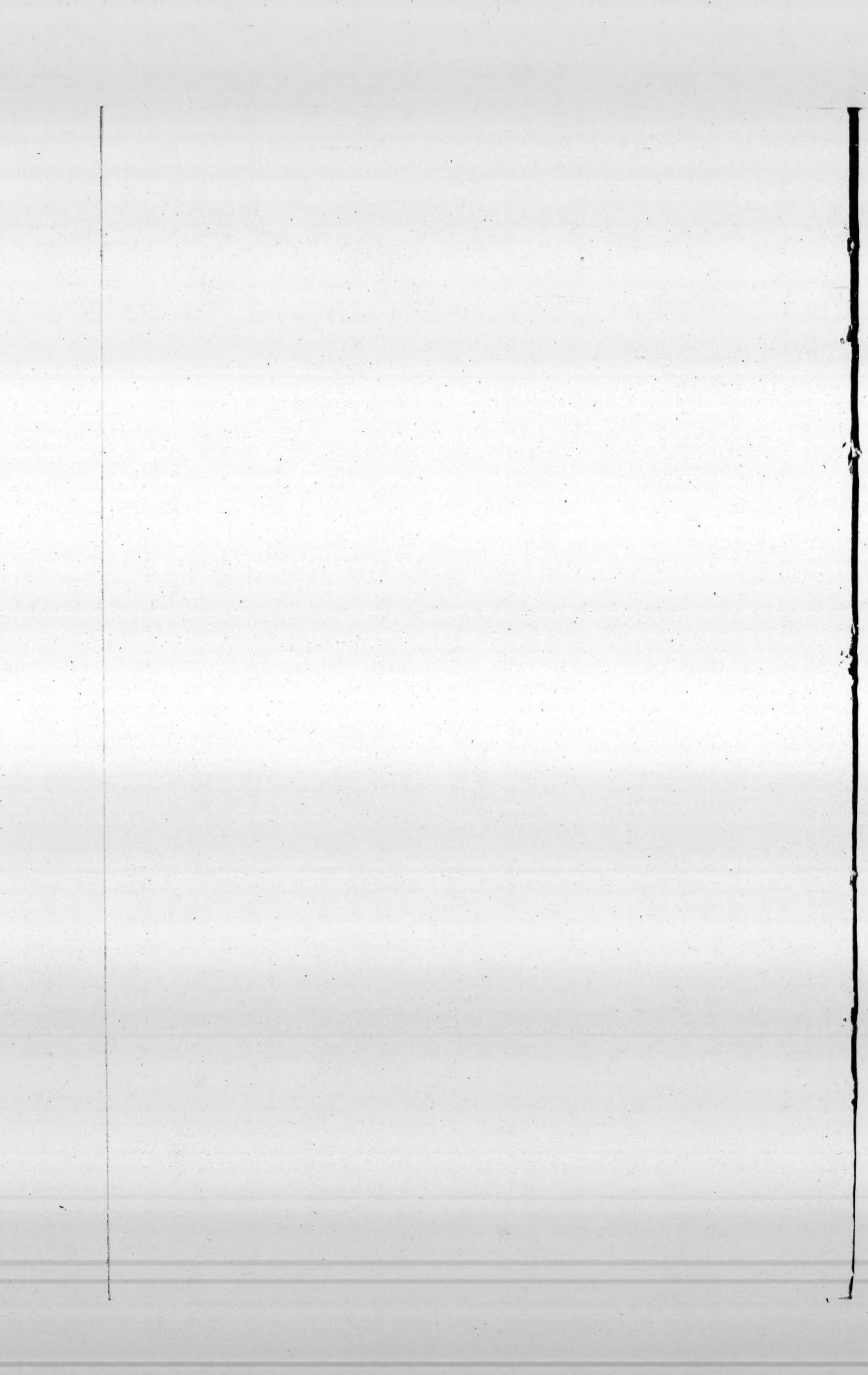
Genus CHLOROPSIS, Jard. & Selby.

95. **CHLOROPSIS CHRYSOGASTER.** *Suprà viridis, nitens; pectore abdomineque ex aurantio luteis; gula, jugulo, lateribus colli, arcuque per oculos ducto atris, conterminio arctè circumscriptis; genis violaceis, macula scapulari æruginosâ; tectricibus, remigibus primoribus, rectricibusque nigris, nitore violaceo; pileo aureo subnitente.*

In the specimens of the female the black mark on the throat and neighbouring parts is not apparent; the spots on the chin and shoulders are obscure; but the general colour of the upper and lower parts is the same as in the male.

Genus DICÆUM, Cuv.

96. *Dicæum erythronotum.* *Certhia erythronotos*, Ind. Orn., I. 290. Red-backed Creeper, Lath., Gen. Hist. of Birds, IV. 241. 'Souimanga à dos rouge,' Ois. dor., II. 57. Pl. XXXV.



November 12, 1839.

William Yarrell, Esq., V.P., in the Chair.

A letter was read from Lady Shelly, relating to the manners, whilst in confinement, of a Black Spider Monkey (*Ateles ater*), recently presented to the Society.

From this letter it appears that the animal in question was extremely gentle and partial to some persons, but disliked others. It learnt many little tricks, and exhibited a considerable degree of intelligence.

A letter from Sir Thomas Reade, Hon. Memb. Z.S., H. M. Consul-General at Tunis, dated Tunis, Sept. 30th, 1839, was read. It stated that that gentleman had forwarded as a present to the Society a living Bubaline Antelope (*Antilope Bubalis*, Pall.), three Numidian Cranes (*Anthropoides Virgo*, Vieill.), and a young Lynx.

A letter from R. J. Bourchier, Esq., Corr. Memb. Z.S., which was also read, states that the above-mentioned specimens are safely arrived at Malta, and that he will take the first favourable opportunity of forwarding them to the Society.

A letter from Lieut. J. Frembly, R.N., Corr. Memb. Z.S., dated Gibraltar, Oct. 17, 1839, was read. This letter relates to some specimens of Fishes which Mr. Frembly had forwarded to the Society.

The specimens referred to in this letter were exhibited.

Professor Owen exhibited the bone of an unknown struthious bird of large size, presumed to be extinct, which had been placed in his hands for examination by Mr. Rule, with the statement that it was found in New Zealand, where the natives have a tradition that it belonged to a bird of the Eagle kind, but which has become extinct, and to which they give the name "Movie." Similar bones it is said are found buried in the banks of the rivers.

The following is an abstract of Profesor Owen's paper upon this bone:—

"The fragment is the shaft of a femur, with both extremities broken off. The length of the fragment is six inches, and its smallest circumference is five inches and a half. The exterior surface of the bone is not perfectly smooth, but is sculptured with very shallow reticulate indentations: it also presents several intermuscular ridges. One of these extends down the middle of the anterior surface of the shaft to about one-third from the lower end, where it bifurcates; two other ridges or lineæ asperæ traverse longitudinally the posterior concave side of the shaft; one of them is broad and rugged, the other is a mere linear rising.

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"The texture of the bone, which affords the chief evidence of its ornithic character, presents an extremely dense exterior crust, varying from one to two lines in thickness; then there occurs a lamello-cellular structure of from two to three lines in thickness. The lamellæ rise vertically to the internal surface of the dense wall, are directed obliquely to the axis of the bone, decussate and intercept spaces which are generally of a rhomboidal form, and from two to three lines in diameter. This coarse cancellated structure is continued through the whole longitudinal extent of the fragment, and immediately bounds the medullary cavity of the bone, which is about one inch in diameter at the middle, and slightly expands towards the extremities. There is no bone of similar size which presents a cancellous structure so closely resembling that of the present bone as does the femur of the Ostrich; but this structure is interrupted in the Ostrich at the middle of the shaft where the parietes of the medullary, or rather air-cavity, are smooth and unbroken. From this difference I conclude the Struthious bird indicated by the present fragment to have been a heavier and more sluggish species than the Ostrich; its femur, and probably its whole leg, was shorter and thicker. It is only in the Ostrich's femur that I have observed superficial reticulate impressions similar to those on the fragment in question. The Ostrich's femur is sub-compressed, while the present fragment is cylindrical, approaching in this respect nearer to the femur of the Emeu; but its diameter is one-third greater than that of the largest Emeu's femur, with which I have compared it.

"The bones of the extremities of the great *Testudo elephantopus* are solid throughout. Those of the Crocodile have no cancellous structure like the present bone. The cancellous structure of the mammiferous long bones is of a much finer and more fibrous character than in the fossil.

"Although I speak of the bone under this term, it must be observed that it does not present the characters of a true fossil; it is by no means mineralized: it has probably been on, or in, the ground for some time, but still retains most of its animal matter. It weighs seven ounces twelve drachms, avoirdupois.

"The discovery of a relic of a large struthious bird in New Zealand is one of peculiar interest, on account of the remarkable character of the existing Fauna of that island, which still includes one of the most extraordinary and anomalous genera of the struthious order, and because of the close analogy which the event indicated by the present relic offers to the extinction of the Dodo of the island of the Mauritius. So far as a judgment can be formed of a single fragment, it seems probable that the extinct bird of New Zealand, if it prove to be extinct, presented proportions more nearly resembling those of the *Dodo* than of any of the existing *Struthionidae*.

"Any opinion, however, as to its specific form can only be conjectural; the femur of the Stilt-bird (*Himantopus*) would never have revealed the anomalous development of the other bones of the leg; but so far as my skill in interpreting an osseous fragment may be credited, I am willing to risk the reputation for it on the statement

that there has existed, if there does not now exist, in New Zealand, a Struthious bird nearly, if not quite, equal in size to the Ostrich."

Mr. Yarrell exhibited some specimens of the Portuguese Man-of-War (*Physalia pelagica*), which were sent to him by the Rev. Robert Holdsworth, who procured them off the coast of Devonshire, at Brixham.

A collection of Skins of Quadrupeds and Birds from the Society's Corresponding Member, Col. H. Warrington, H. M. Consul-General at Tripoli, was exhibited.

November 26, 1839.

William H. Lloyd, Esq., in the Chair.

An extensive collection of shells, sponges, &c., presented by J. B. Harvey, Esq., Corr. Memb. Zool. Soc., was exhibited. The specimens contained in this collection are from South Australia, and were principally collected in Kangaroo Island.

Prof. Rymer Jones called the attention of the Meeting to certain specimens contained in this collection, and to the sponges in particular, and, having made some observations upon their structure and mode of reproduction, he entered into the question relating to their animal or vegetable nature.

Mr. Waterhouse laid before the Meeting the following tabular view of the distribution of the *Rodentia* :—

	Europe and North Asia.	North America.	Africa.	India and Islands.	South America and West Indian Islands.
MURINA.	<i>Sciuridae.</i> 5. Sciurus. 1. Pteromys. 1. Tamias. 3. Spermophilus. 2. Arctomys.	20. Sciurus. 3. Pteromys. 5. Tamias. 10. Spermophilus. 8. Arctomys. 1. Apodemus.	5. Sciurus. 3. Xerus.	25. Sciurus. 9. Pteromys.	6. Sciurus.
	3. Myoxus.		2. Graphiurus. 3. Myoxus.		
	8. Dipus.	2. Meriones.	4. Dipus.		
	16. Mus.	6. { Mus. Hesperomys.	10. Mus. 2. Dendromys. 6. Gerbillus. 1. Sigmodon. 2. Neotoma.	12. Mus.	30. { Mus. Hesperomys.
	6. Cricetus.		1. Psammomys. 3. Euryotis.	2. Gerbillus. 1. Phloeomys. 2. Rhizomys.	3. Reithrodon.
	1. Castor.	1. Castor. 1. Ondatra.			
	20. Arvicola. 4. Lemmus. 2. Spalax.	8. Arvicola. 4. Lemmus. 10. Geomys.			
HYSTRICINA.	<i>Hystri-</i> <i>cidae.</i> 1. Hystrix.	1. Erethizon.	1. Hystrix. 1. Aetherura.	1. Hystrix. 1. Aetherura.	3. Cercolabes. 2. Synetheres.
	<i>Octo-</i> <i>Chin-</i> <i>Octo-</i> <i>Chinidæ. chilidæ. donidæ.</i>		1. Aulacodus. 1. Orycterus. 4. Bathyergus. 1. Petromys.		3. Capromys. 1. Myopotamus. 10. Echimys. 6. Nelomys. 1. Cercomys. 2. Dasyprocta. 1. Cœlogenys.
LEPO- RINA.	<i>Caviidæ.</i> <i>Leporidae.</i> 5. Lepus. 3. Lagomys.	15. Lepus. 1. Lagomys.	6. Lepus.	2. Ctenomys. 1. Poephagomys. 1. Octodon. 2. Abrocoma.	
				1. Chinchill. 2. Lagotis. 1. Lagostomus.	
				6. Cavia. 2. Kerodon. 1. Dolichotis. 1. Hydrochœrus.	
				1. Lepus.	
	31 spe. 16 gen.	99 spe. 19 gen.	53 spe. 16 gen.	58 spe. 10 gen.	39 spe. 25 gen.

Mr. Waterhouse stated, that in the construction of this table he had endeavoured to display the geographical distribution of the sections of the order *Rodentia*, and that to accomplish this, it of course became necessary to combine some system of classification, with an arrangement of the genera according to the countries in which they were found. The table is divided into five columns, one column being devoted to each of the following portions of the globe: 1st, Europe and North Asia; 2nd, North America; 3rd, Africa; 4th, India and the Indian Islands; 5th, South America and the West Indian Islands.

In these columns the names of the genera found in each province are inserted, and the number of known species belonging to each genus (as nearly as can be ascertained) is also indicated. Horizontal lines separate the genera according to the sections to which they are supposed to belong.

"The few Rodents found in Australia all belong to the family *Muridæ*. About six species are known, and these appertain to the genera *Mus*, *Hapalotis*, Licht. (which is the *Conilurus* of Mr. Ogilby), *Hydromys* and *Pseudomys*.

"The first thing that strikes the attention," observed Mr. Waterhouse, "is, that the great mass of South American Rodents belong to a different section from those of the northern portions of the globe, and that they are of a lower grade of organization, as is also the case with respect to the Old and New World Monkeys."

The next point to which Mr. Waterhouse drew attention was the relative number of species found in warm and in temperate climates. "If the number of species found in the two provinces, Europe (including North Asia) and North America, be added together, the total is 180 species, whilst in all the rest of the world, taken together, the amount is only 206; and if from this last number those species which inhabit the temperate portions of South America and Australia (amounting to about 30) be deducted, and added to the first amount, it would appear that the Rodents are most abundant in temperate regions. In the Mammals of large size the case is reversed.

"The total number of species inhabiting each of the provinces pointed out in the table varies less than perhaps might be expected. The European province, North America, and South America, are nearly equal as to the number of species they contain; India and Africa are also nearly equal, but they contain fewer species than either of the other provinces.

"The Squirrels, Rats, Porcupines, and Hares (constituting the genera *Sciurus*, *Mus*, *Hystrix*, and *Lepus*), are the only groups which are found in all the provinces.

"The *Sciuridæ* abound most in North America and India, and are least abundant in Africa and South America. In the latter country they appear to be chiefly confined to the northern portions, and are totally wanting in the southern.

"The *Muridæ* are about equally abundant in Europe, Africa, and South America; in North America and India they are much less numerous.

"The *Arvicolidae* appear to be confined to North America and the European provinces. In South America they are apparently replaced by the *Octodontidae*, *Chinchillidae*, and *Caviidae*.

"The family *Leporidae* is but feebly represented in each of the provinces above-mentioned, excepting in North America, where the number of species already discovered is almost equal to all those found in other portions of the globe taken together. In earlier periods, these Rodents, which are very low in the scale, appear to have been much more numerous, judging from the fossil remains which have been found,—at least in the European province.

"The remaining families of Rodents are almost entirely confined to South America. The genus *Aulacodus* of Western Africa, the genera *Petromys*, an inhabitant of the Cape of Good Hope, and *Bathyergus*, found both at the Cape and north-east portions of Africa, possess certain characters in which they approach the South American forms. *Petromys* analogically appears to represent the Octodons of South America, and *Bathyergus* may be compared to the genera *Poephagomys* and *Ctenomys*; whilst in *Aulacodus* we possess a representative of the *Capromys* of the West Indies."

Mr. Waterhouse observed "that he had not yet been able to satisfy himself as to the precise situation, in a systematic classification, of the genera *Ctenodactylus* and *Helamys*, the former from North, and the latter from South Africa. Four other genera are omitted in the above table for the same reason; they are, *Otomys** of Dr. Smith, a genus found at the Cape of Good Hope; *Akodon*, Meyen, which inhabits Peru; *Heteromys*, Desmarest, founded on the *Mus anomalus* of Thompson, an animal found in the island of Trinidad; and lastly, *Saccoomys* of F. Cuvier, which is supposed to be from North America. These four genera in all probability belong to the family *Muridae*.

"The genus *Aplodontia* is placed with the *Sciuridae*, but it must be observed that it differs much from the typical species of that group, there being no post-orbital process to the skull, and the molar teeth being rootless.

"The remains of Rodents found in a fossil state indicate that the different provinces were formerly inhabited by the same forms as those which are now found in them."

* This is a different genus to the *Otomys* of Cuvier, which is *Euryotis* of Brants.

December 10, 1839.

William H. Lloyd, Esq., in the Chair.

A letter from Dr. Weissenborn, dated Weimar, October 6, 1839, was read. It accompanied a present of two specimens (male and female) of the black variety of the common Hamster (*Cricetus vulgaris*), and a head, preserved so as to display the cheek-pouches of that animal. The writer of the letter states that he possesses a common Pigeon, just fledged, in which no vestiges of the organs of vision can be traced. "The orbits are tolerably well developed, and lined with a sort of half-mucous membrane, and therefore destitute of feathers. I have never heard of a similar defect in any animal; and in one where the incubation is extra-uterine it appears doubly wonderful or anomalous. The bird is quite healthy, and presents in its habits several curious anomalies, which may be traced to its monstrosity."

Professor Owen communicated his notes on the Anatomy of the Biscacha (*Lagostomus trichodactylus*, Brookes).

"The individual dissected," says Mr. Owen, "was a female, full-grown, weighing 8 pounds 2 ounces, avoirdupois: the weight of the brain was 5 drachms, avoirdupois, the proportion of the brain to the body being as 1 to 416. This is the smallest relative size of the brain that has yet been recorded in the Rodent order, in some of the species of which order, as the Mouse, the brain approaches that of Man, the relation of its mass to that of the body being as 1 to 46; that of the human subject is as 1 to 30. The brain presented the usual broad depressed form and simple unconvoluted surface characteristic of the Rodent order: its length was 1 inch 8 lines, its breadth 1 inch 5 lines, and the length of the cerebral portion 1 inch 3 lines. The proportion of the cerebellum to the cerebrum was as 1 to 5. The breadth of the *medulla oblongata* was to that of the *cerebrum* as 1 to 6. The upper surface of each lobe of the cerebrum is marked with two slightly curved fissures, each between 3 and 4 lines in length, and one a little in advance of, and exterior to the other: a single anfractuosity defines the external convex prominence of the cerebrum. On the under surface a fissure is continued from the posterior part of the cerebral hemisphere forwards, along the middle of the natiform protuberance, to the outer boundary of the root of the large olfactory nerve.

On laying open the abdomen an immense accumulation of adipose membrane concealed the viscera; the bag of the great omentum formed, however, a small part of this covering, as after extending down over half the abdomen it was reflected upwards, in front of the liver. The lower half of the abdominal cavity was overlapped

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by broad and thick adipose processes, continued from the lower convolutions of the colon, without being connected with the great omentum, and from the fundus of the urinary bladder. The *appendices epiploicae* of the human colon may be regarded as rudimentary conditions of the adipose folds here so enormously developed. The stomach corresponded in form and relative size with that of the *Chinchilla* (see Trans. Zool. Soc., vol. i. p. 51. pl. V.). The left blind extremity projected about an inch beyond the cardia; the pyloric end became suddenly contracted: the cuticular lining of the œsophagus terminated at the cardia in five pointed processes, radiating from the cardia.

The duodenum was dilated, as in many other phytophagous Rodents, at its commencement; it descends with a slight sigmoid flexure to the right lumbar region, then crosses over to the left side, being freely suspended in a broad duodenal mesentery, which contracts as the gut perforates the base of the meso-colon to become the jejunum. The small intestines presented the usual disposition: the cæcum is of moderate length, viz. four inches, with a diameter of two and a half inches, thus corresponding in general form with that of the *Chinchilla*. The colon first crosses obliquely the lower part of the abdomen, and returns, forming a fold of about four inches in extent; it then describes a second much larger and narrower fold, of ten inches in length: it is at the bend of this fold that the fæces begin to be separated into pellets, and it is from these loops that the omental processes are continued: the colon then bends over the root of the mesentery, passing below the stomach to the left side of the abdomen, where it describes a series of convolutions before ending in the rectum. No omental process is continued from these folds, but the meso-colon, to which they are suspended, is of great breadth, and was loaded with fat.

Feet. Inches.

Length of the small intestines	14	9
large ditto	7	5

"The anal, vaginal, and urethral outlets are separate from one another.

"The liver consists of a left lobe, a cystic lobe, and two small right lobes, with a spilegian appendage. The cystic lobe is fissured, and the left division is perforated on its free convex surface to receive a process of the suspensory ligament.

"The gall-bladder was of very small size.

"The spleen is triangular, with the upper or anterior angle most produced.

"The kidneys and suprarenal glands as usual in Rodents. The heart presented the usual form; two superior venæ cavae, the left joining the inferior cava, and receiving the coronary vein. The right lung presented three lobes and the median lobule; the left lung three lobes.

"There was nothing remarkable in the ovaria or fallopian tubes. The two uteri terminate by distinct valvular orifices; they are long

and narrow : in each mesometry there is a plexus of transversely disposed vessels, principally veins, which runs parallel with the uterus, and seems to represent the remains of the wolffian body. The most interesting feature in the generative organs was a longitudinal septum, dividing the vagina into two canals for upwards of an inch beyond the *ora tincæ*. This septum terminated by a thin concave edge, directed towards the outlet of the vagina. There was no constriction or valvular fold between the divided and the undivided portions of the vagina ; the former were somewhat more vascular, and slightly plaited longitudinally. The whole length of the vagina was four inches. The clitoris was perforated by the urethral canal, and was nine lines in length.

" No other placental quadruped has hitherto presented so near an approach to the marsupial type of the female organs as the *Lagostomus*. Rudiments of a vaginal septum occur in the young or virgin state of several genera ; but it is only in the *Lagostomus* that a continuation of the median separation of the genital tubes has been continued beyond the uterine portion along so great an extent of the vagina, and as a permanent structure."

Professor Owen also communicated the following paper, entitled "Observations on the Generative System of some of the lower Animals," by Professor Rudolph Wagner, M.D.

" Among a variety of observations which I undertook on the coast of Nice in August and September 1839, for the purpose of obtaining a more intimate knowledge of the anatomy and physiology of marine animals, there are several which perhaps afford some more general interest for the natural history of animals.

" Many of my own earlier observations had produced the conviction, that a disjunction of the sexes is much more universal than has been hitherto admitted. Cuvier, in his 'Règne Animal,' and after him the most of those who have entered upon Zoological Classification, still assume that among the so-called lower animals many are no more than females, and others without sex.

" Thus, to begin with the *Mollusca*, and judging from assertion, the *Cyclobranchiata* up to the present time are known only as females. I succeeded as well in *Patella* as in *Chiton* in finding some individuals that were males, and others that were females. The males have a white testis, with active spermatozoa, resembling those of muscles ; the females have all the elements of the primitive ovum. The *Ascidiae* also appear to be of disjoined sex. I found, however, in several species merely ova, but ova that presented the germinal vesicle and germinal spot.

" Among the *Radiata* I had hitherto found only females, as well in the Starfish as in the Sea-urchin and the *Holothuriæ*. The pear-shaped vesicles which open into the efferent duct of the ovary in *Holothuria tubulosa*, and which Delle Chiaje regards as testes, positively showed no spermatozoa in three individuals, in which the pale rose-red ovary was otherwise much developed, and presented the most beautiful ova, with germinal vesicle and germinal spot. But

in the first individual which my friend Professor Valentine opened, the organ corresponding and very similar to the ovary immediately presented a difference (from the ovary) in its white contents. We also saw indeed in those contents the most beautiful spermatozoa, much resembling those of osseous fishes. Numerous other individuals constantly presented themselves, either as males or females.

"Regarding the *Medusæ*, Von Siebold of Dantzig had already mentioned that he had found male individuals with spermatozoa in *Medusa aurita*. In Nice I convinced myself with the greatest certainty in *Pelagia*, *Aurelia*, *Cassiopeia*, and a fourth genus, that these *Medusidæ* are always of disjoined sex. The males, with their spermatozoa actively moving (even within the capsules of the testes), are at the first glance to be distinguished from the females, whose ovaria always contain ova in different stages of development*.

"It is of especial interest to find that a disjunction of sex admits of demonstration, even in the *Polyps*. One of my companions, Dr. Erdl, (?) of Munich, found in *Veretillum* only female individuals in one *Polypary*, and in others only males. He writes me that he has afresh convinced himself of the same relation in *Alcyonium*, though the specimen had been preserved in spirit; and that among the *Mollusca* he has found similar sexual differences in *Halyotis*; thus in the *Aspidobranchia* of Cuvier.

"I must here remark, that my earlier statements on the spermatozoa of the *Actiniæ* are erroneous, since I regarded entirely peculiar and remarkable capsules with long threads (situated even on the prehensile arms) as spermatozoa.

"My researches on the spermatozoa of cartilaginous fishes have shown the remarkable fact that the individual genera of the Rays and Sharks are distinguishable by the form of their spermatozoa. These spermatozoa are for the most part spirally wound, as in birds of song. Very remarkable is the structure of the testis; which is constantly connected with a largely developed and winding *vas deferens*. That which Johann Müller has described in the Rays as a peculiar gland is nothing else than this *vas deferens*. The relations in form of the male genital organs alternate much, as I shall show in a special and more comprehensive work.

"The facts here reported were not witnessed by myself alone, but also by Professor Valentine of Bern, Dr. Peters of Berlin, and five young zootomists, pupils of mine, who were all in Nice at the same time as myself, and took a part in my observations."

* I shall state these sexual relations in a special and detailed work on the whole anatomy and physiology of the *Medusæ*.

December 24, 1839.

No meeting took place.

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